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Commodore

MAGAZINE

OCTOBER 1987, *Volume 8, Number 10*



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FEATURES

COVER STORY

COVER PHOTO: *Dennis Degnan*
Software: *MathTalk* by First Byte

DEPARTMENTS

To the Editor:

I just bought a C128 over here in Malaysia. It was, however, very frustrating when I found out that there are very few 64/128/CPM users "practising their knowledge" here. I would like to get in touch with any users in the U.S. so I can find out more about this fantastic machine. I have lots of 64 software but find it difficult to get programs for the 128 and CPM. Anyone out there who can provide assistance? If anyone is interested in swapping hints, advice, utilities, etc. or just exchanging "Western-Eastern ideologies" on the 64, they can write to me care of the above address.

Yours faithfully,
Calvin
PO Box 1032
10840 Penang
Malaysia.

To the Editor:

First of all, let me thank you for your great magazine. It is the best source of Commodore type-in programs I have ever seen. However, John Iovine's article "Interfacing Commodore's User Port, Part 3" in the July 1987 issue had a few errors in the circuit diagrams. Pins 1 and 8 of TLC548 chip go to pin 2, +5V, not pin 1, ground, of the user port. Also, pin 6 of the chip should go to pin 7, SP2, of the card connector instead of SP1. This will eliminate the myriad of 255's that the program will spit out with the errors.

I am, though by no means an expert, quite knowledgeable in the field of electronics, and it took me three hours to debug the circuit. Therefore, I am sure there are quite a few people who figured that they had wasted seven dollars on the chip. Hopefully this will alleviate their problem.

Yours Truly,
Ryan Biggs

To the Editor:

I have just finished reading your article "Monster-Whompin', Map-Making, Evil Wizard Excitement" in the August 1987 issue of *Commodore Magazine* and would like to start out by saying that I am pleased the field of computer fantasy role-playing games is again getting public attention. For a long time these FRP games were purchased by only a small but loyal following, however recently they have found acceptance in a variety of age and interest groups. Your article was one of the most comprehensive I have seen and Shay Addams should be congratulated for reaching far corners of this diverse field, yet separating it from arcade games and text adventures with a sword-and-sorcery theme.

At this point I wish to inform you that I am the author of *The Shard of Spring*, one of the games mentioned in your article, and wish to inform you of a few oversights made. The first sentence regarding *The Shard of Spring* reads: "For your first multiple-character game, *Shard of Spring* gives you a four-member team of spellcasters and swordswingers to send after the dastardly Lord Dragos."

The Shard of Spring allows five character parties, not four, and I have never heard of a "Lord Dragos." The villain of my game is a dragon named Siriadne. Another oversight was that *The Shard of Spring* was omitted in the box of references at the end of the article on page 125. *The Shard of Spring* is published by SSI.

I'm glad you enjoyed my game and urge you to continue coverage of the Fantasy Role-Playing field.

Sincerely yours,
Craig Roth
Horizon Fantasies

To the Editor:

In a recent article, "Monster-Whompin; Map-Making, Evil Wizard Excitement" by Shay Addams, you made reference to three role-playing games for the Commodore 64 without the publishers' names. I would very much appreciate if you could tell me the name of each publisher.

1. *Shard of Spring.*
2. *Grounds of the Mad Overlord.*
3. *Titanic: The Recovery Mission.*

Thank you,
Matt Cioffi

Editor's Response: We apologize for the omissions in this feature. The correct information is as follows:

Shard of Spring *is published by SSI.*

Grounds of the Mad Overlord *is the name of the first game in the* Wizardry *series from SIR-TECH.*

Titanic: The Recovery Mission *is published by Activision.*

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Screenshots stolen from the ATARI ST version.
**Some versions do not contain graphics. Please check before purchasing.*

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RGB Adaptor for the Amiga 500

C LTD. has announced the RGB Adaptor, an RGB analog to separated composite video interface for the Amiga 500. The small box connects to the video port of the Amiga 500 and provides both chroma and luminance signals through a pair of RCA phono jacks. A pair of simple RCA to RCA cables then connect the box to any separated video composite monitor (including the Commodore 1701, 1702, 1802, 1802C and 1902).

The RGB Adaptor retails for $49.95 and is planned for a September release. For more information contact C Ltd. 723 East Skinner, Wichita, KS 67211. Or call (316)-267-3807.

SMART SPEAKER



Swisscomp Inc. has introduced the **Smart Speaker,** an advanced text to speech converter. It connects to any computer having a standard parallel or a serial port and will work with any software that can drive a printer. The ASCII text is converted into speech by the Smart Speaker and spoken through its built-in speaker.

The **Smart Speaker** sells for $229.95 complete with parallel printer cable, DC power adaptor and manual. For more information contact Swisscomp Inc., 5312 56th Commerce Park, Tampa, FL 33610. Or call: (813)-628-0906.



Irving Gould, Chairman & Chief Executive Officer, Commodore International Ltd., right, delivers a 4 × 5-foot letter of congratulations to Alan Ashton, President, Wordperfect Corporation, left.

WORDPERFECT FOR THE AMIGA

Wordperfect Corporation has announced the release of **Wordperfect** for the Amiga family of computers. Rated as a top word processor on the IBM PC/XT, **Wordperfect** has been expanded and improved on the Amiga, taking full advantage of the additional capabilites of the computer. In addition to all of the standard word processing features, Wordperfect allows you to open and work on 32 windows/documents at the same time. Other features include a spell checker with 115,000 words, a thesaurus of both antonyms and synonyms, proportional spacing, outlining with automatic number and letter generation, macros, up to five columns of text per page, footnotes, and index and table of contents creation.

Wordperfect is available for $395 for the Amiga 500, 1000 and 2000 (at least 512K is required). For more information, contact Wordperfect Corporation, 288 West Center Street, Orem, UT 84057. Or call: (801)-255-5000.

SCULPT 3-D

Byte by Byte Corp. has released **SCULPT 3-D,** a single frame generation package for the Amiga. **Sculpt 3-D** allows Amiga owners to use ray tracing algorithms to create a variety of images. Screens utilizing the full range of the Amiga's color palette can be created using simple graphic primitives and manipulation tools.

SCULPT 3-D has a suggested retail of $99.95. For more information contact Byte by Byte Corp., Arboretum Plaza II, 9442 Capital of Texas Highway North, Suite 150, Austin, TX 78759. Or call: (512)-343-4357.

GEOPUBLISH DESKTOP PUBLISHING

Berkeley Softworks has released a new desktop publishing package called **geoPublish.** Users can create multiple page, multiple column documents such as newsletters, freely mixing text columns, graphic images and line graphics on each page.

Users can also create a customized master page which contains graphics and text to appear on each page of a document.

geoPublish is available for $69.95. For more information contact Berkeley Softworks, 2150 Shattuck Avenue, Berkeley, CA 94704. Or call: (800)-443-0100.

GEOCALC AND GEOFILE

Berkeley Softworks presents **geoCalc,** the GEOS based spreadsheet, useful for all personal financial analysis

Continued on pg. 10

Commodore User Group Promotion

Commodore Business Machines has created a special promotion for user group members who purchase the Amiga 500. For a limited time, members of participating user groups can purchase one of the following two software packs:

For $99, Pack A includes **Textcraft Plus** (word procesor), **Deluxe Paint II** (graphics), **Aegis Pagesetter** (desktop publishing), **Marble Madness** (arcade game) **Animator** (animation graphics), and the Epyx 500XJ joystick. Retail value of the package is $599.

For $199, Pack B includes **Pagesetter Deluxe** (desktop publishing), **Wordperfect** (word processor), **Superbase** (database), **MaxiPlan 500** (spreadsheet), **CLImate** (CLI utility), **Deluxe Video** (desktop video) and **Diga!** (telecommunications). This pack has a retail value of $1200.

The promotion is scheduled to run through October 31, 1987.

Continued from pg. 8

needs. The program includes a spreadsheet containing 112 rows and 256 columns for data, basic arithmetic functions to 12 places of accuracy and advanced math funtions to 9 places of accuracy.

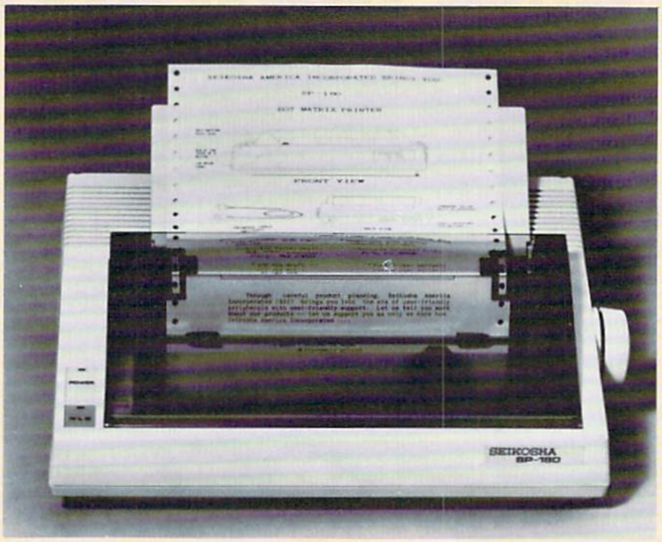
Also new is **geoFile,** the GEOS based filing system (data base) for managing virtually all types of information. Data is stored and organized in "forms" which the user designs on the display screen. Special features include automatic data sorting, keyword search command and full page database form size (8-1/2 by 11 inches).

geoCalc and **geoFile** retail for $49.95 each from Berkeley Softworks,
2150 Shattuck Ave., Berkeley CA 94704. Or call: (800) 443-0100.

COMPUTERIZED GREETING CARDS

Classic Compu has introduced two new thematic greeting card collections, "Seasons Greetings" and "Merry Christmas." The greeting card collections are colorfully illustrated and are designed so that the user can add personal pizzazz to messages, greetings and announcements inside each card. Each collection is packaged with 50 stationery cards and 40 matching envelopes.

From now until March 31, 1988 Classic Compu is offering a special sampler pre-pack offer on any one of their computerized greeting card collections. With a coupon each greeting card collection will be available at $9.95 instead of the regular retail price of $11.95. For further information contact Classic Compu, 3100 W. Chapel Ave., Cherry Hill, NJ 08002. Or call: (609)-667-5310.



NEW SEIKOSHA SP-180 SERIES PRINTERS

Seikosha America Inc. has introduced its SP-180 Series dot-matrix printers. The new models feature simple operation and a streamlined design. The Seikosha SP-180VC is Commodore 64 and 128 compatible and prints 100 cps in draft and 20 cps in NLQ modes. Features include tractor and friction feed, variety of character attributes, and built-in margin and line space designation.

The new models retail for $249.00. For more information contact Seikosha America Inc., 1111 Macarthur Boulevard, Mahwah, NJ 07430. Or call: (212)-255-8491.

GEOPROGRAMMER UNVEILED

GeoProgrammer is the new full-featured application development software package from Berkeley Softworks. Designed to facilitate application development for GEOS, **geoProgrammer** is targeted at enthusiasts with a good understanding of 6502 assembly language. The package contains three main functions: **geoAssembler** (reads source text from a **geoWrite** document), **geoLinker** (accempts link structure from the **geoWrite** document and reads relocatable object modules produced by **geoAssembler)** and **geoDebugger** (interactive symbolic debugger).

geoProgrammer is available through Berkeley Softworks, 2150 Shattuck Ave. Berkeley, CA 94704. Or call: (800)-443-0100.

FLEET SYSTEM 2+

Professional Software Inc. has released **Fleet System 2+,** for the Commodore 64. In addition to the features found in the **Fleet System 2** program, such as a 90,000 word dictionary, 80 column preview and mail merge, **Fleet System 2+** offers on-screen word wrap, an integrated thesaurus for synonyms and antonyms, cut and paste, multiple disk drive support and a free **Fleet Filer** database program.

Fleet System 2+ retails for $59.95. For more information contact Professional Software Inc., 51 Fremont Street, Needham, MA 02194. Or call: (617)-444-5224.

FREE LAN FILE SERVER FOR AMIGA

C Ltd. has released a preliminary version of its SCSI-based Local Area Network to the public domain. Amiga owners may now connect several machines to one mass storage device (hard drive, CD ROM, etc.), free of charge. The file server requires use of the SCSI host/controller which is supplied on all C Ltd. hard drives (also available separately). The file server is already on CompuServe in the Amiga Forum area (data library #DL-11 Search: "Multi-user). Customers may download the program and documentation at no extra charge.

For more information about the LAN File Server contact C Ltd., 723 East Skinner, Wichita, Kansas 67211. Or call: (316)-267-7322.

EOS: EARTH ORBIT STATIONS

Electronic Arts has released **EOS: Earth Orbit Stations,** a strategic simulation based on NASA's space development plans for the next 50 years. **Earth Orbit Stations** puts players in charge of building and managing space stations throughout the solar system, ultimately leading to the search for alien life.

There are seven different game scenarios which can last from two to forty hours. Up to 39 different modules such as shuttleports, space telescopes and chemical labs can be used to construct an infinite variety of stations. You can invest station profits in research for new technology or commercial ventures.

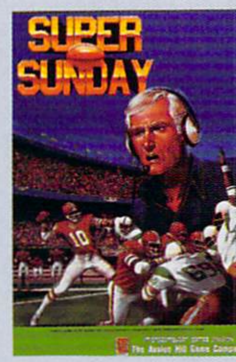
For more information contact Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404. Or call: (415)-571-7171.

Continued on pg. 12

The best just keeps getting better!

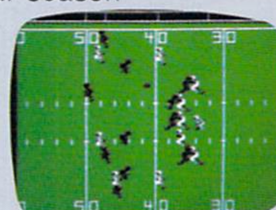
At first it was just the best professional football game around. Now we've expanded it by adding disks that add a new dimension to the game. It moves you from the Super Bowl to the sidelines of the regular season. From the best to the baddest, we're challenging your coaching skills and getting you to create that great "what-if" game or run a league in which one team can defeat another team on any given Sunday.

THE SUPER SUNDAY LINEUP



Super Sunday Deluxe Edition: Contains 38 Super Bowl Teams, plus 6 pre-Super Bowl Championship teams. Also has an accelerated Autoplay feature that plays a complete game in three minutes **with all statistics.** With the 1986 Season and GM disks, (each sold separately) you can run your own league solo, playing a week's worth of games in one hour, and then coaching your own team in Super Sunday's solitaire scenario!

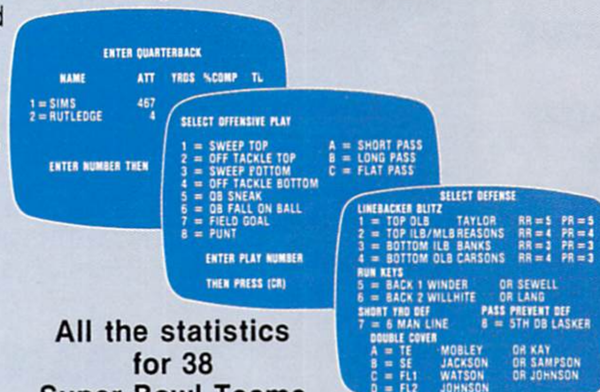
The 1986 Season Disk: NEW! For high drama the last season cannot be beat. Can you take Denver all the way! Was Chicago a one-season fluke? Indianapolis couldn't have done any worse, could they? Take over as head coach of any of the 26 regular season teams and decide for yourself. Also available: 1984, 1985, and Champions disk.



Full-screen re-enactment of all your plays!

1 or 2 players.

The Office of the General Manager: The GM Disk—NEW! You have NEVER seen anything like this! It doesn't just create new teams and save statistics. It prints out everything, including team rosters, so you can handle your own draft. You can even create league standings to record wins, losses and points scored, and name it after yourself and your buddies! The GM disk uses easy-to-read menus, and can move from Super Sunday to the office and back in minutes.



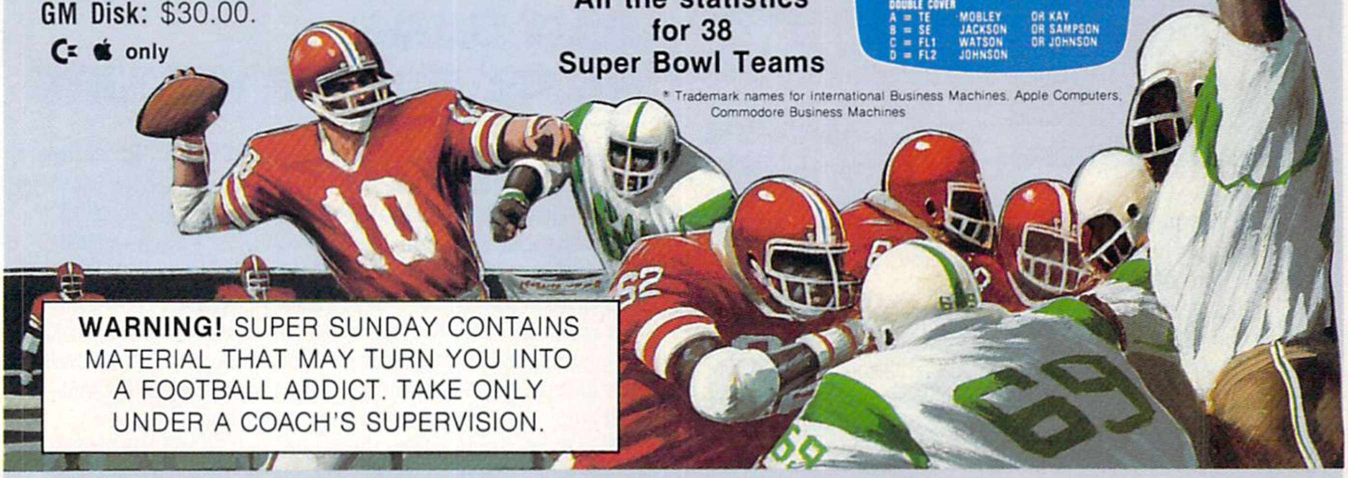
All the statistics for 38 Super Bowl Teams

Super Sunday Game Disk: $35.00
C= Apple IBM* CGB req'd

1984, '85, '86 Seasons: $20.00
C= Apple IBM* CGB req'd

GM Disk: $30.00.
C= Apple only

* Trademark names for International Business Machines, Apple Computers, Commodore Business Machines



WARNING! SUPER SUNDAY CONTAINS MATERIAL THAT MAY TURN YOU INTO A FOOTBALL ADDICT. TAKE ONLY UNDER A COACH'S SUPERVISION.

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BLUE POWDER GREY SMOKE

Ralph Bosson's **Blue Powder Grey Smoke** is the latest Civil War command and strategy game from Garde Games of Distinction. The game has been designed with an eye toward entertainment and graphics action, featuring a zoom-in for close-up movie-style combat display. Mechanics are joystick-controlled with on-screen menus, which frees you to concentrate on strategy and tactics. **Blue Powder Grey Smoke** combines the excitement of action simulation with the depth of a wargame.

Blue Powder Grey Smoke is now available on the Commodore 64 and 128. For more information contact Garde Games of Distinction, 8 Bishop Lane, Madison, CT 06443. Or call: (203)-245-9089.

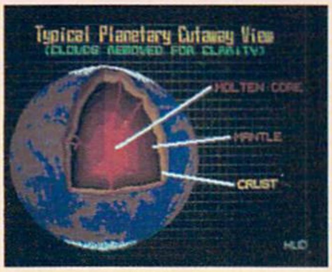
RSVP

Blue Lion Software recently introduced **RSVP** a program designed to test and expand your knowledge of manners. You can be tested either through gameplay and simulation or simple question and answer sessions on a choice of topics.

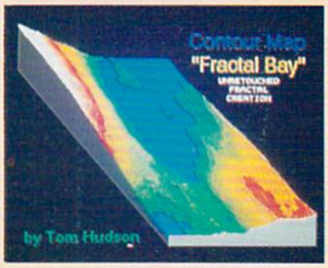
The game option starts you at the bottom of the ladder in your chosen career. You must work your way through a series a interactions that require know-ledge of manners and propriety. The more formal learning mode allows you to choose a category or country and be quizzed on the subject.

RSVP is available on the Commodore 64 and 128 for $29.95. For more information contact Blue Lion Software, PO Box 650, Belmont, MA 02178. Or call: (617)-876-2500.

COMPUSERVE PRODUCT ALLOWS FOR GRAPHICS EXCHANGE



Users of incompatible microcomputers can exchange high resolution graphic images with a new file format introduced today by CompuServe Inc. The Graphics Interchange Format, or GIF (pronounced "jif"), allows for the exchange of high resolution graphic images between microcomputers without regard to hardware compatibility. Typical uses of GIF will include the exchange of



diagrams, charts and graphs, illustrations, computer art images and digitized photographs. The GIF programs and sample files are available through the hardware forums on the CompuServe Information Service that correspond to the computer models utilizing the GIF format, and in other CompuServe forums, including the Picture Support Forum (PICS).

CompuServe has placed the GIF protocol into the public domain but retains copyright on the encoders and decoders provided by the company. For more information contact CompuServe Inc., 5000 Arlington Centre Blvd., PO Box 20212, Columbus, OH 43220. Or call: (614)-457-8600.

PRESIDENT ELECT — 1988 EDITION

Strategic Simulations Inc. has revised and updated their computer game, **President Elect — 1988 Edition.** The game matches up candidates and situations for the 1988 elections and determines the likely winner (it accurately predicted the outcome of the Reagan/Mondale race three years before the election). In a recent simulation, George Bush defeated Albert Gore by a landslide. If you are interested in changing history, the game can re-create any of the elections from 1960 through 1984.

President Elect — 1988 Edition is available on the Commodore 64 and 128. For more information contact Strategic Simulations Inc., 1046 N. Rengstorff Ave., Mountain View, CA 94043. Or call: (415)-964-1353.

CHUCK YEAGER ADVANCED FLIGHT SIMULATOR

Electronic Arts has announced **Chuck Yeager's Advanced Flight Simulator.** The program was co-designed by General Yeager and includes his flight trianing and aeronautic expertise. The program uses a super-fast frame rate which lets you experience the thrill of mach speed flight. Three levels of General Yeager's personal onscreen instruction are featured: basic flying skills, advanced maneuvers like aileron rolls and hammerhead stalls and acrobatic stunts. Also included is a Test Pilot option which offers a selection of 14 classic aircraft, from the Sopwith Camel F-1 to the Bell X-1, plus three experimental planes.

Chuck Yeager's Advanced Flight Simulator will be available for the C-64/128. For more information contact Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404. Or call: (415)-571-7171.

DAN DARE: PILOT OF THE FUTURE

Electronic Arts has released **Dan Dare: Pilot of the Future,** a game based on the adventures of the famous comic book character from England. **Dan Dare** is the first product in the **Amazing Software** line, a new line of entertainment software targeted specifically at action-adventure, arcade-oriented game enthusiasts. In this episode, **Dan Dare** finds himself searching for his friends Digby and Professor Peabody, imprisoned on a deadly atomic asteroid which is hurtling toward Earth. Our hero must stop the asteroid, rescue his friends from the evil Mekon and his gang of Treen thugs, and ultimately save Earth from impending destruction.

Dan Dare is available on the Commodore 64 and 128 for $19.95. For more information contact Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404. Or call: (415)-571-7171.

Compiled by James Esch



Preview The Future!
PROJECT: STEALTH FIGHTER
Stealth aircraft . . . the hottest topic of discussion in aviation circles today. Space age technology and engineering make these aircraft virtually undetectable by enemy radar. Stealth fighters are believed to now be operating from top secret military bases, flown only on the most sensitive missions and only by the most experienced pilots.
Precise information about this next generation of Air Force jets is highly classified. But extensive research has enabled the aviation experts at MicroProse to incorporate the potential design and performance characteristics in a powerful new simulation.
Slip into the cockpit of **PROJECT: STEALTH FIGHTER** and familiarize yourself with the advanced "heads-up display"(HUD) and sophisticated 3-D out-the-cockpit view. At your disposal is a dazzling array of state-of-the-art electronics, weapons and countermeasures.
But remember, flying a stealth aircraft takes more than just fighter pilot reflexes. The real challenge is mastering the jet's electromagnetic profile to avoid enemy radar, while executing a deep-strike mission into North Africa or conducting delicate photo reconnaissance over Eastern Block seaports. Also featured are carrier and land-based takeoffs and landings, as well as land, sea, and air targets and threats.
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Compiled by Louis F. Sander

LOU SANDER'S TIPS & TRICKS

If you have a tip or short program to share with other readers, write it up and send it in. One trick per sheet of paper, please. We pay from $10 to $50 for each item we use. Send them to:

Louis F. Sander
P.O. Box 101011
Pittsburgh, PA 15237

Enclose a self-addressed stamped envelope and we'll send you a Hint Writer's Guide. Readers outside the U.S. may omit the stamp.

All about the reset button: Here is a summary of the important features of this sometimes mysterious control for the 64 and 128. The information presented is based on years of personal experimentation with many different computers, but due to periodic ROM changes, your own machine may perform a bit differently.

The 128's reset button is on the right side of the computer, next to the main power switch. The 64 comes without a reset button, but many 64 owners have installed one by plugging it into an external port. There are four common connection points on the 64.

Between pins 2 and 6 of the serial I/O port: Get a plug to fit the port and connect a normally open pushbutton between these two pins. Identify the proper pins by looking for the tiny numbers molded into the plastic part of the connector. Be careful if you use published diagrams for the connectors, because they don't always say which end of which connector they depict. Diagrams in Commodore manuals usually show the solder terminal end of the male connector.

Between pins 1 and 3 of the user I/O port: Follow the instructions above. Be careful, because it's easy to insert your connector upside down, putting your switch across the wrong two pins. If you can get a polarizing key for your connector, you can avoid that possibility.

Between pins A and C of the expansion slot: Be extra careful that you use the proper pins, since Commodore diagrams sometimes identify them differently from the industry standard. Many people use a discarded cartridge to house this type of reset button.

Across capacitor C34 inside the computer: It's been reported that some of the above connections won't work on 64's made since late 1984. If your warranty has expired, you might try this internal connection. C34 is a 0.1 microfarad capacitor located near pin 8 of the 556 timer chip installed in location U20. Connect your button across its two leads.

When you press the reset button, the computer behaves almost as though you turned it off and then back on. I say almost because turning the power off erases everything in memory, while using the reset button only resets part of memory. Using the reset button also saves wear and tear on the power switch and many internal components.

Essentially, pressing the reset button activates the routines which set the computer's memory to its power up condition. Locations below the start of BASIC are initialized, as are the I/O locations in high memory. Zeroes are put into the three lowest positions in BASIC's user area, but other memory locations are left alone.

Here are the most important effects of this process:

The computer is removed from any lockups, endless loops, or other undesirable states which may exist.

All peripherals on the serial bus are reset. This often corrects lockups and other problems having to do with the disk drive, printer and modem.

Memory locations below the BASIC program area are restored to their power up values. This disables any machine-language programs that might be in use, even though the programs themselves may still remain in memory. It also clears the cassette buffer, erasing any machine language stored there and resets the 128's function keys to their power up definitions.

All memory-mapped I/O locations are returned to their power up values. This resets screen colors, special graphics modes, the SID (sound) chip, and so on.

Your BASIC program remains in memory, but because pointers have been reset and the zeroes have been inserted, the computer cannot find it. Later on, we'll show how to resurrect the program on the 128. On the 64, you will have to use an UNNEW program.

Machine language in the BASIC program area is untouched, as is any machine language in the 64's protected area from 49152-53247 decimal.

The 128's high-resolution graphics screen is preserved, except that the first three bytes are changed to zeros and the GRAPHIC 0 mode is invoked.

On the 128, several other keys will modify the computer's response in very important ways if pressed when the reset button is pushed.

If the Commodore key is held down when the reset button is pressed, the computer will go into 64 mode and any programs in memory will be lost. If you have a 1571 disk drive, it will recognize only the first side of any disk it may contain. You can use both sides in 64 mode by resetting in 128 mode, then entering GO 64 and responding YES to the prompt.

Continued on pg. 16

GIVE YOUR COMMODORE A FLEET TO COMMAND!



"A" Rating.
– Run Magazine, March, 1987.

Fleet System 2+ and 4 are powerful, easy to use and inexpensive. Both Fleet System 2+ for your Commodore 64 and Fleet System 4 for your Commodore 128 include an Integrated Dictionary and Thesaurus.

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Continued from pg. 14

When entering 64 mode by using the reset button, be sure to keep the Commodore key pressed until you see the 64-style message on the screen. If you let it up too soon, you could return to 128 mode.

If the STOP key is held down when you press the reset button, the computer will be reset to 128 mode, but with the machine-language monitor active. BASIC is not initialized, so if there is a 128 BASIC program in memory at the time of the reset, it will still be accessible at this time. To find it, enter X to exit the monitor, then do a list to see your program. As you can see, using stop with the reset button can be very useful for uncrashing BASIC programs in 128 mode.

Even though it doesn't disturb BASIC, this method, like the others, returns the function keys to their power up values.

Surprisingly, the stop/reset combination also calls the monitor from 64 mode, although it's not 100% useful. You can use the monitor to examine or change 64 memory locations, and even to save blocks of memory to disk or tape. But you can't use the X command to exit from the monitor, so you're stuck there until you use the reset button again.
Louis F. Sander
Pittsburgh, Pennsylvania

Reading protected directories: On some protected disks for the 64, the directory is protected from being listed. You can often overcome this protection by putting the computer into 128 mode and using the DIRECTORY command. Sometime you even get a message in addition to the directory—my X-15 Alpha Mission game displays a message about hackers when the above process is carried out.
Dwaine Shank
Damascus, Maryland

First program on disk: I often like to use a menu program which lists the disk directory and lets the user easily choose his program. Although this menu program is the last one saved on the disk, it's best to have it as the first one in the directory, where it can be loaded with the asterisk wildcard or by using the 128's RUN key.

With a little advance planning, it's easy to put the menu program in the first position on the directory. When I format a new disk, I immediately write a dummy program consisting of just a line number and a colon. I save it with a name like PLACEHOLDER, and of course it goes into the first position in the directory. When I'm ready (much later) to save my menu program, I scratch PLACEHOLDER and save the menu program. Its directory entry takes the place of that for PLACEHOLDER—first in line in the directory.
Marvin1
Q-Link

Great programs: If you enjoy my personal contributions to this column, you should look into my software library on the Q-Link on-line service. It contains dozens of programs which I've found useful or amusing over the years and I've polished up for all my friends on Q-Link.

There are numerous utilities included, as well as games of all sorts. There's even a very nice BASIC tutorial adapted from one for the very early PETs. Most of the games are simple ones using keyboard graphics and BASIC. Most of the utilities are in machine language. Several of the programs are greatly enhanced versions of ones you've seen in this column.

To find my library, get into the Commodore Software Showcase and select Special Edition Software. The menus will guide you from there.
Louis F. Sander
LouSander1
Pittsburgh, Pennsylvania

Lullaby: This program for the 64 or 128 will play a well-known lullaby by Johannes Brahms.
Joseph R. Charnetski
Dallas, Pennsylvania

```
10 REM LULLABY - JOSEPH R.CHARNETSKI
20 R=54272:FOR J=R TO R+23:POKE J,0
   :NEXT
30 POKE R+5,10:POKE R+6,9:POKE R+24,15
40 FOR J=1 TO 51:READ P,T:CK=CK+P+T
50 POKE R+1,P:POKE R+4,33
60 FOR S=1 TO T*128:NEXT:POKE R+4,32
70 FOR D=1 TO 64:NEXT:NEXT:POKE R+24,0
80 IF CK<>1976 THEN PRINT"DATA ERROR"
81 DATA 31,2,31,2,37,8,31,2,31,2
82 DATA 37,8,31,2,37,2,50,4,47,6
83 DATA 42,2,42,4,37,6,28,2,31,2
84 DATA 33,8,28,2,31,2,33,8,28,2
85 DATA 33,2,47,4,42,2,37,4,47,2
86 DATA 50,8,25,2,25,2,50,8,42,2
87 DATA 33,2,37,7,31,2,25,2,33,2
88 DATA 37,2,42,4,31,2,37,8,25,2
89 DATA 25,2,50,8,42,2,33,2,37,8
90 DATA 31,2,25,2,33,4,31,6,28,2
91 DATA 25,8
```

Space Harrier hints: Since this is my favorite game, I've done some research and found some pokes that might be fun to use. Here's how.

Load the program, and when the READY prompt appears, enter:

POKE 1011,248 : POKE 1012,252 : RUN

Press the RETURN key to load the next part. When it has loaded, enter: POKE 816,167 : POKE 817,2 : POKE 2096,248 : POKE 2097,252 : SYS 2061 When the computer resets, make any of the following pokes:

POKE 53277,3	— Gets rid of all poles
POKE 14212,234	— Speeds up the game
POKE 7673,0 to 15	— Changes shoe and jacket color
POKE 7797,0 to 15	— Changes trouser color

When everything is finished, enter SYS 2128 to start the game.
Unknown Contributor
Dubai, United Arab Emirates

Better labels: It's often difficult to get labels to print on a word processor or database program, since these applications are oriented to full-size sheets of paper. Often, changing the program's sheet size will let it work easily with your label stock. Many labels are one inch high and hold six lines of printing. For these, just set your page size to six, and watch how things improve.

In *PaperClip*, the command to send is PP6:PG5. Other word processors will have similar commands.
Andre Leduc
Ontario, Canada

Continued on pg. 118

Make Any Computer Do Exactly What You Want With McGraw-Hill's

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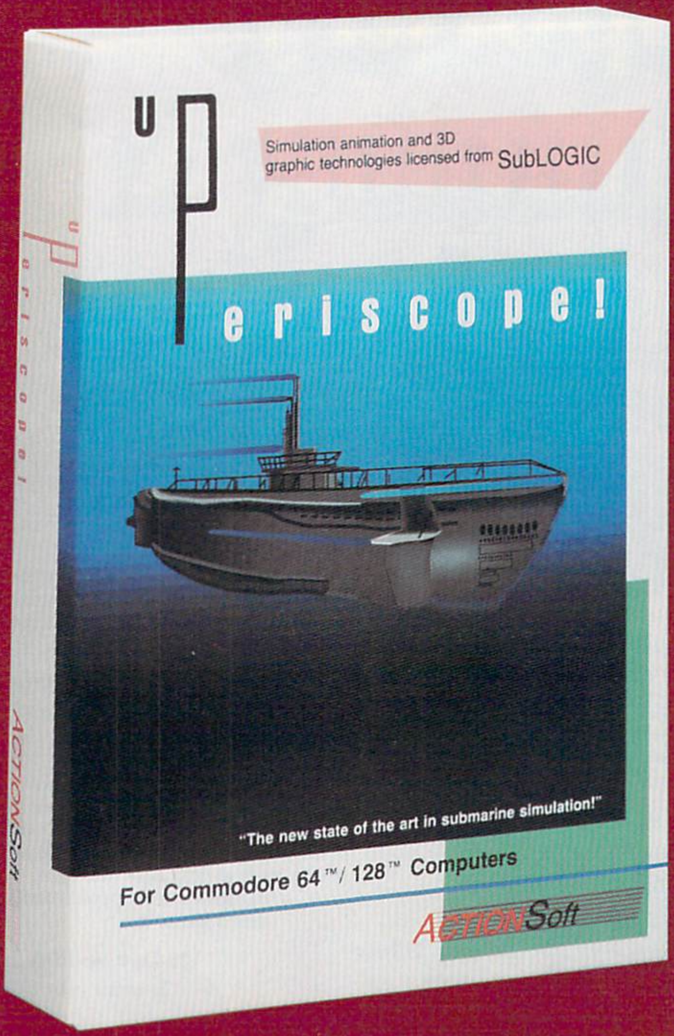
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Fire 7	Accu-Sound™ realism	Yes	No
Fire 8	Torpedo Types	3	1
Fire 9	Auto or Manual Torpedo Launch	Yes	Yes
Fire 10	Time-Day-Month-Year Selection Capability	Yes	No
Fire 11	Zoom Feature	Map or Ship Views	Map View Only
Fire 12	Submarine Strategy & Tactics Manual by John Patten, Capt. USN (Ret.)	Yes	No
Fire 13	Auto-Load Feature on C128	Yes	No
Fire 14	Joystick Required	No	Yes

ON RIGHT OUT OF THE WATER!







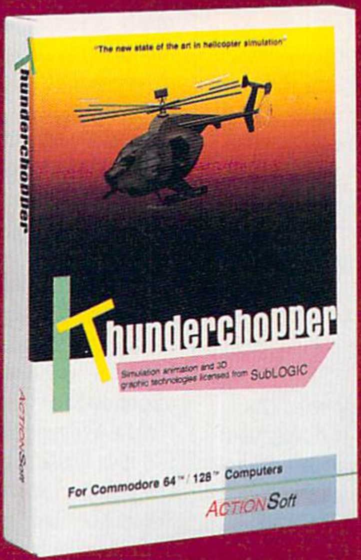






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AMIGA Tips & Tricks

Compiled by Tim Jones

Welcome to Amiga Tips and Tricks. Each month, we will offer a series of tidbits, teasers and short programming examples for using and programming the Amiga. In this installment, we look at the Workbench and its associated functions.

If you have an item that you would like to submit for use, you can send it to:

Commodore Amiga Tips
651 Outrigger Dr.
Deltona, FL 32738

Items should be to the point, but describe your point completely. We welcome game tips and program usage tips as well as the type of items in this installment. If we use your hint, tip or program example, we will pay between $10 and $50.

Workbench Directory Creation and Copying: If you are preparing a disk for use as a files disk and you wish to place directories on it, you should copy the 'EMPTY' directory from your WorkBench disk to create new directories, or drawers. To do this, open your Workbench disk and then open your files disk. Click on and hold the EMPTY directory drawer icon of the Workbench disk and drag it across to your files disk. Once the drawer is copied, you single click on the EMPTY icon on your files disk and select RENAME from the Workbench menu. Enter the name that you wish to use for the newly created directory. Now you can copy and move files to the new disk using the Workbench.
Dave Tillop
Orlando, FL

Multiple Copies of the SAME Directory: If you create a new disk and then create directories on that disk by copying the EMPTY drawer to it, you will find that the drawer icons will all appear in the same place on the display when the disk is opened. To remedy this you must manually select each drawer and drag it to a new location. Then, while it is still selected, use the SNAPSHOT function in the Special menu to write its new location to disk. This must be done for each drawer that you wish to move.
Steve O'Conner
Pease AFB, NH

Adjusting Workbench Drawer Contents: If you play with the contents of the various directories or drawers of your disks, you will probably create quite a mess on your screen that can make it very difficult to access the files that you wish to use. If you have just opened a disk or drawer, you can use the CLEANUP option of the Special menu to straighten out the display. The key is to use CLEANUP as soon as you open the disk or drawer as any changes you make to the display will disable the CLEANUP option. CLEANUP will place the the icons in a manner that it assumes is orderly on the display. This may mean that some of the icons will be out of the window display area of your disk or drawer. If this is so, you can resize the window so that most or all of your icons are showing.

In the case of a disk which uses custom icons that are larger than usual, you may have to manually place these icons by clicking and dragging them to suitable positions.

In either case, once you have the icons placed and the window sized the way that you want it, you must update the .info file on the disk that you are working on. This is done using the SNAPSHOT option of the Special menu. SNAPSHOT, however, only works on icons that are selected. So, you must select ALL of the icons that you wish to place as well as the drawer or disk icon so that all of the information is written out to the disk.

To do this, use the SHIFT key in combination with your mouse to select multiple icons. While holding down the shift key, move to each icon in the window and click once. After all of these icons have been selected, (still holding down the shift key) click on the drawer icon (if it's a drawer) or the disk icon (if it's a disk). Once all the selection is done, select SNAPSHOT from the Special menu and the locations and window size will be written to the appropriate .info file(s).
Tim Jones
Deltona, Fl

Opening and Closing disks: Most people don't have any use for the OPEN and CLOSE commands in the Workbench menu because double-clicking and close gadgets are simpler to use. Normally, selecting an icon, pulling down the menu and selecting an option is too cumbersome. However, by using the SHIFT key to select multiple disks or drawers, you can open or close them all at once. The OPEN command will attempt to open any disk, drawer or task (program) just as if you double-clicked on it. The CLOSE command will only work with disks and drawers.
Jim Gracely
Commodore

.INFO files...WHAT are they?: If you normally use the Workbench while operating the Amiga, but move into the CLI environment once in a while, you may notice a bunch of files that have the same name as the actual files on the disk but with .info appended to them. These are the files that contain information for the Workbench environment and tell the Amiga what type of file it is (Disk, Draw (Drawer), Tool, Project or Garbage), what the deletion status is (Protected or Deletable), and, in the case of Tools, how big the stack should be and any default settings to use when entering the program. If the file is a Project, it will include information concerning the Default Tool (which program

Continued on pg. 78



Apple II & compatibles, Commodore 64/128, IBM & compatibles.

TASTE THE THRILL OF VICTORY AND THE AGONY OF THE STREET.

The pros may be the best, but these players are definitely the baddest.

Presenting the Street Sports™ Series from Epyx.

In *Street Sports Basketball,* you'll shoot hoops in dingy alleys. Playgrounds. Parking lots. Occasionally, even the suburbs (have fun dribbling on the lawn).

You'll pick your three-person team from the 10 toughest players in the neighborhood. There's hot shooters and slow dribblers. Team players and show-offs. There's guys who can shoot the eye out of a needle at 20 feet. And guys who couldn't sink one if they were sitting on the backboard. Pass on the run. Get that big man on the inside. Let Joey pop 'em from the corners. This is real street strategy. Take a hook shot. A tip-in.

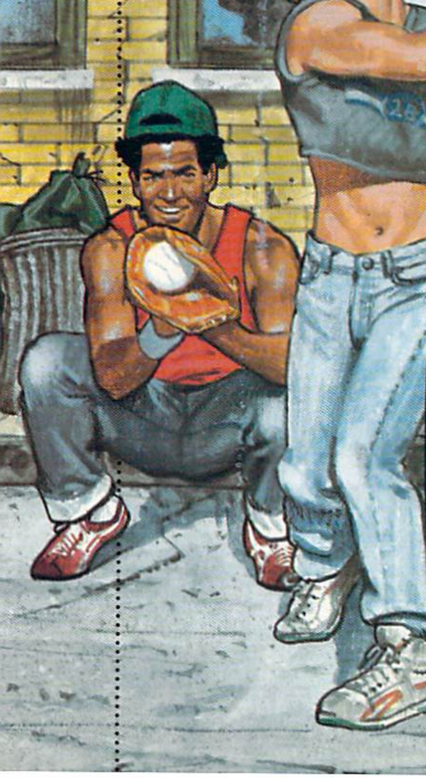


Sometimes it's best to take a pass.

Bounce the ball off the chain-link fence, then go for the basket. Or power through a slam dunk.

But don't dribble in the oil slick. And for heavens sake, watch out for windows.

It's not like any basketball game you've ever played on a computer. But just like every basketball game you've ever played for real.





Notice that somebody just stole second base. Funny, it was here a minute ago.

ANOTHER HIT. It's bottom of the ninth. Batter's 0 and 2. The score—well, maybe it's time to take up bridge.

Introducing *Street Sports Baseball.*

It's not going to be as simple as you thought to be the first on your block.

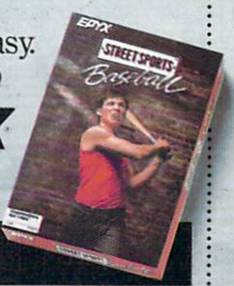
After all, you'll have to cope with makeshift diamonds, bases made from spare tires and trashcans, bushes, rocks, even squealing cars.

Not to mention 16 neighborhood players. Each with their own personalities and skills in pitching, hitting and fielding. With the right combination, you could be the champs. With the wrong combination, the chumps.

You'll pick the place. The team. The positions. The strategy. And then, you'll be right in the middle of it all. With a split-screen view from above and up close.

It won't be easy. But it's right up your alley. **EPYX**

Apple II & compatibles, Commodore 64/128, IBM & compatibles.



THE STREET SPORTS SERIES

Reviewed by Scott A. May

Parallax

Computer: Commodore 64
Publisher: Mindscape
3444 Dundee Road
Northbrook, IL 60062
Medium: Disk
Price: $29.95



Your job is to find alien scientists, steal their data cards, and insert them into the remote terminal.

Parallax is a tightly constructed high-speed shoot-'em-up and puzzle-solving contest for one player. As the game begins, you and four fellow astronauts have arrived on an alien world, separated within the planet's five horizontal regions—Alpha, Beta, Gamma, Delta and Epsilon. The planet teems with hostile aliens, directed by a massive computer intelligence. You discover the computer is passing information through the zones, preparing an attack on earth. Your mission is to advance through each zone, locate your allies, and destroy the central computer before it is too late.

To gain passage to higher levels, you must decode a five-letter password for that zone. This involves accessing the central computer through remote terminals located in each zone. When the correct password is entered for the fifth level (Epsilon), the central computer will self-destruct. Your final task is to reach the Intergalactic Teleport and exit to safety.

The action is viewed from above your spacecraft as it skims the alien landscape. Surface features include strange floating platforms containing runways, gun turrets and assorted alien structures. The overhead 3D graphics are not just an illusion, however. Open areas between platforms allow you to fly beneath the surface. Use it as the quick escape from surface conflict, but be aware of other aliens who inhabit the sub-level. A geometric crosshatch, visible through gaps in the platforms, moves in counterpoint to your ship's direction, further giving the effect of 3D depth.

The central computer's remote terminals are housed in hangars, scattered about the platforms on each level. To access a terminal, you must land your ship and enter each hangar on foot. Once inside, the screen displays an enlarged overhead view of the room. The contents of each hangar usually include various computers, robots and alien scientists.

Your job is to find alien scientists, steal their data cards, and insert them into the remote terminal. Each valid data card will reveal one letter of the secret password. One shot from your laser pistol will stun the scientist and two will vaporize him, so be careful. Your ship's computer stores letters of the password as they are found.

The first scientist you encounter is considered kidnapped and will accompany you throughout the zone. Although there are dozens of remote terminals in each zone, only one will accept the complete password. The password is entered by the kidnapped scientist, who must be drugged to cooperate. Upon success, the scientist is transformed into one of your allies, who is considered rescued. You may then proceed to the next zone. Exiting a zone without the password will destroy your ship and end the game.

Included with the game is a quick reference card detailing important joystick and keyboard commands. There are three joystick modes used in the game—one for flying, another when grounded and one for moving around on foot. The act of piloting your spacecraft is the game's only weak point, due to an inverted directional design. Other keyboard commands allow you to raise/lower your landing gear, turn the ship's shields on and off, view your collected data cards and passwords, and pause/resume the game.

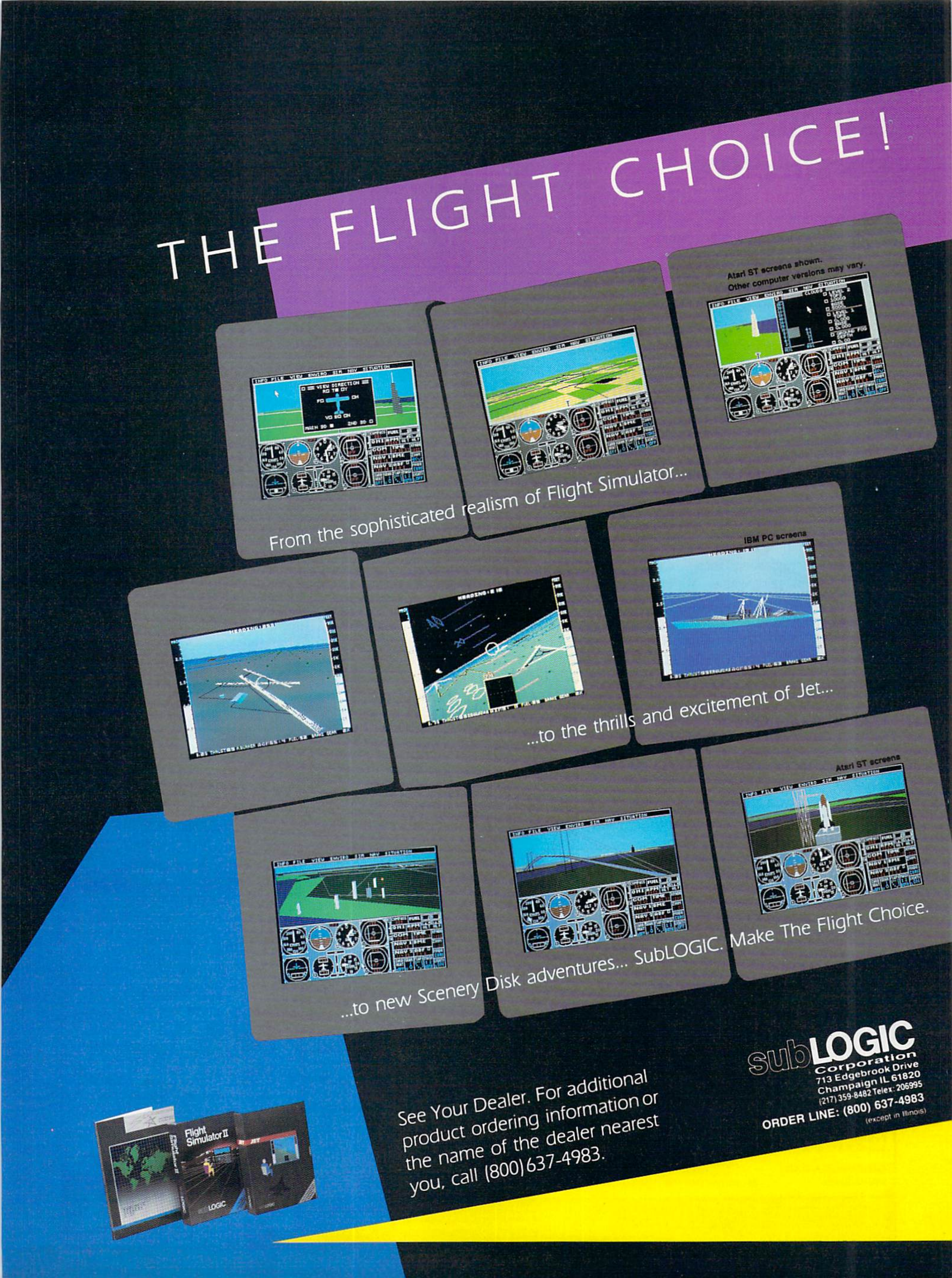
In flight you are constantly reminded of your ship's oxygen, fuel and damage points. Damage is inflicted by alien fire, running into structures and attempting to land on a rough surface. Shields will protect you from aliens but cause the ship to consume fuel more quickly.

Data cards taken from scientists can also be used to gain credits from computer bank terminals in some hangars. These credits can in turn be used at computer shops—also located in several hangars—to buy additional oxygen, fuel and ammunition. Run out of fuel or oxygen and the game is over. High scores are saved permanently to disk.

As you advance to higher levels, the challenges increase proportionately. Alien ships increase in volume and combat accuracy, and the landscape develops deadly new dimensions. Black holes allow you to increase your speed, helpful for escaping aliens and flying through traps. Hyperspace ports randomly transport your ship to another location on the same level.

The game's colorful, high-tech graphics are superb. The excellent use of shadowing gives every form a solid, textured appearance. The animation is spotless and the background music is both inspirational and unnerving.

Parallax is a prime example of the quality software imported by Mindscape. This is state-of-the-art arcade fare you will thoroughly enjoy. C


THE FLIGHT CHOICE!
Atari ST screens shown.
Other computer versions may vary.
From the sophisticated realism of Flight Simulator...
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Flight Simulator II

Reviewed by Jack Emberly

Building Perspective

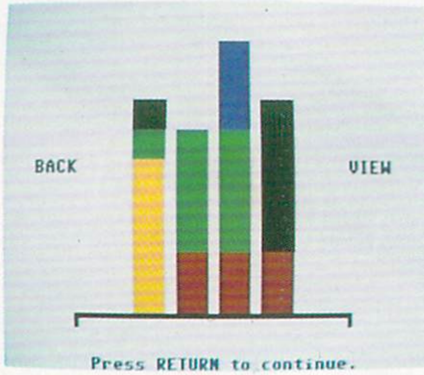
Computer: Commodore 64
Publisher: Sunburst Communications
39 Washington Avenue
Pleasantville, NY 10570
Medium: Disk
Price: $59.00
Grades: 4-Adult

Recall the annual staff photo? Three rows, shortest in the front, average in the middle, tallest in back. We easily see 5-foot Miss Jones in front of Mr. Brown at 5'8 and Mr. Draft at 6'2.

Building Perspectives is similar to this with two exceptions. Firstly, buildings replace people, and secondly, the photographer has perversely hidden some short structures behind taller ones. Our task is to reveal the heights of all the towers in a 3x3 building array, using "front," "back," "right" and "left" perspectives. We may remove buildings to see what stands behind them but this will not produce the whole picture. Sound challenging? It is, especially when working with 4x4 and 5x5 arrays.

Problem solving software is becoming the best single activity for developing the "critical thinking" skills. This fine program will test "spatial" thinking while exercising Bloom's thinking "skills," and Polya's 4-step thinking "strategy."

Here's how it works. Firstly, choose the array size. My students started with the



easiest, a 3x3 array. A random configuration of buildings was loaded in. Our options now are to "view," "remove," "predict," or "give up."

Cursoring to front view brought forth a colored diagram of buildings seen from head on. To our far left we saw a tower of 9 blocks. We knew 2 more towers hid behind this one but couldn't see them since buildings of 1 to 9 blocks would be concealed by the first 9-block structure. Only a left view could reveal all 3 towers in this left row. Before utilizing left view we settled on two "thinking" strategies suggested for visualizing the array. First, on worksheets provided, we listed the heights of all towers discernable from a front view only. Next, using interlocking unifix blocks we constructed a model of these towers in correct positions.

Still using the front perspective we could see a middle tower of 6 blocks in the first slot and a 9-block tower behind that. Perhaps the 9-block tower seen occupied the second of three positions in this row, but possibly a tower shorter than 6 blocks hid in the second spot. Only removing blocks or viewing from different angles would reveal the truth.

Still from the front, the far right showed a 2-block structure in the first position and an 8-block structure behind. Again, since a 1-block or 2-block structure could be hidden behind the first tower, we held incomplete data for this row of the array.

A left view now provided additional information. Using this data we deduced part of the remaining unknown. A right view would now reveal the remaining towers. We could learn the truth as well by "removing" a tower in the front.

Electing to remove we determined the complete array. Now cursoring to "predict" we entered the tower heights in a screen graph of the array and were congratulated for a correct solution.

Arrays of 4x4 and 5x5 are even more challenging. In these the 4 views reveal towers around the perimeter but not the internal towers. Here, with more possibilities, the positions of towers is the major challenge. There is a constant need therefore to analyze and synthesize facts to determine remaining tower heights.

How delighted Bloom would be with this thinking skills activity. George Polya would appreciate the demand to determine the problem, plan along specific thinking strategies and check results.

The package includes program disk and backup, and vinyl binder containing step-by-step procedures, teacher objectives and support activities. Several challenging follow-up activities for paper and pencil encourage students to experiment at constructing arrays of their own. C

The time: 1400 hours. Somewhere in the Pacific. Some ill-fated coordinates in World War II.



Damage Control reports a hit on the starboard side. Send in Alpha, Baker and Charlie to repair.

eyeball to eyeball action. This time around you'll be right in the middle of it all. You knew it wouldn't be pretty.

But how tough could it be to rescue a downed pilot?

Will it be the twin 40mm Bofors anti-aircraft guns? Or the 5" lead-spewers aft? Depth charges or torpedoes? Autopilot or guts?

LIFE, LIBERTY AND THE HAPPINESS OF PURSUIT.



Radar spots inbound Zeroes. Ready forward gunnery positions. Man the anti-aircraft turrets. They're coming.

You're at the helm, commanding the greatest concentration of firepower ever put in a lightweight fighter. The deadly Fletcher Class Destroyer.

You've embarked on the first simulation that actually combines the intricate, large-scale strategy of wargaming with the intensity of furious,

It sure seemed a lot easier than shelling islands, escorting a convoy or hunting subs.

Or so you thought. But now look what you've got. Thirteen fully-operational, ear-bursting battle stations to worry about, all armed to the gills. Not to mention radar. Navigation. Sonar.

And half the Japanese fleet crawling up your spine.

Time to make some tactical decisions.

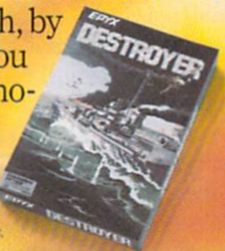
YOU'VE ALWAYS DREAMED OF BEAUTIFUL MODELS. Now you can pick up an entire assault fleet, including a replica Fletcher Class Destroyer, from Revell. Or win an authentic scrambled eggs *flight deck cap. Sweepstakes details are in every box, or write for an entry coupon. No purchase necessary. Sweepstakes ends June 15, 1987. Official rules are available at participating dealers.*

Any choice could be your last, so make it good.

Suddenly, you hear the ominous rumble of incoming Zeroes. You fire, and send one plummeting to the sea, trailing a plume of smoke.

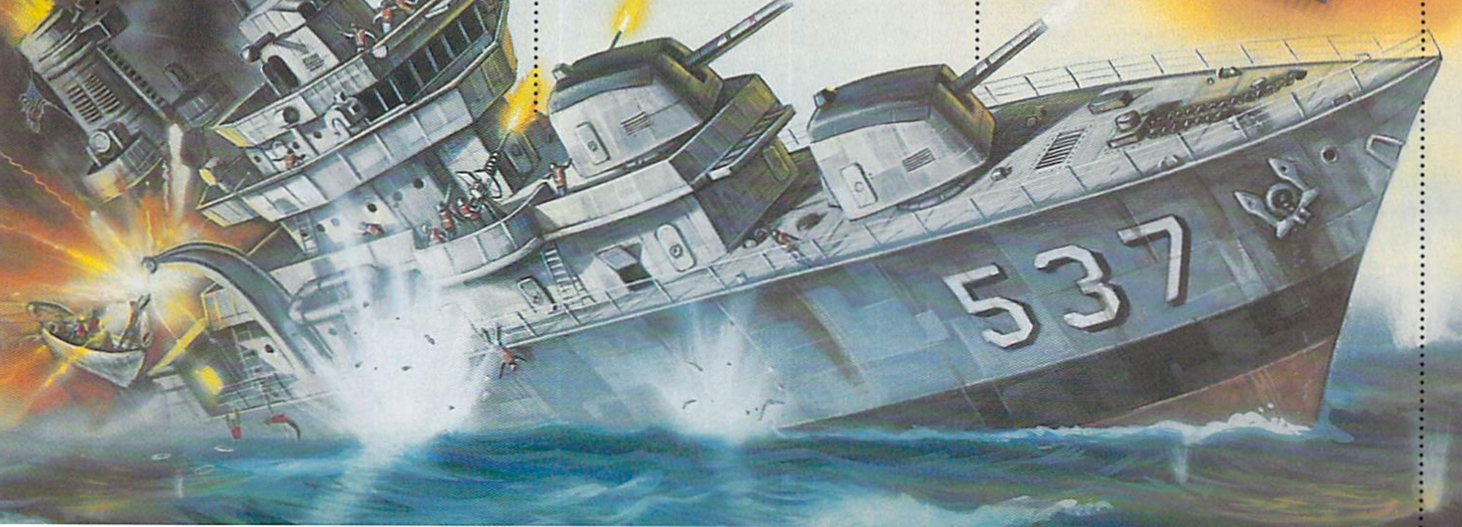
On instinct, you instruct the bridge to commence evasive maneuvers.

Even though, by experience, you know there's nowhere to run.



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Apple II & compatibles, C64/128, IBM & compatibles.



Reviewed by Mark Cotone

World Tour Golf

Computer: Commodore 64
Publisher: Electronic Arts
1820 Gateway Drive
San Mateo, CA 94404
Medium: Disk
Price: $29.99

Swing down the fairways and hack through the roughs of some of the game's most renowned and distinct courses.



Most professional sports have strict guidelines governing the legal parameters of their play. The distance from first to third, end zone to end zone, and baseline to baseline will always remain constant no matter what park, stadium or court you happen to visit. But golf is different. The only requirement in the course design of this sport is that each hole contain a flat tee-off area (a beginning) and a groomed putting surface (an end). That's it.

Course architects are allowed to let their creative, masochistic spirits run wild as they shape and manicure the contours of the land to produce a wide variety of imaginative playing fields. Each hole becomes a singular puzzle that requires a specific strategic attack. This innovative diversity of design, one of the strongest lures in the game of golf, is the basis for Electronic Arts' *World Tour Golf*.

Here is a golfer's fantasy, a chance to swing down the fairways and hack through the roughs of the game's most renowned and distinct courses. And it can all be done without the usual annoying play restraints like nasty weather, impatient crowds and exorbitant greens fees.

Tee-off time is whenever you please. In the way of preparation, the program simply asks that you specify the size of your party and outline the attributes of each of the players. Every *World Tour* golfer is rated according to club distance, hitting accuracy and overall handicap. At the beginning of the round, the unbiased program creates everyone equal. From there, depending upon personal skill and experience, players are given the option of adjusting their surrogate's characteristics to either reflect their golfing ability (fat chance) or the masterful talent they wished they possessed. Once this personal tinkering is complete, it's off to the links.

Trying to decide on which golf course to play might be the toughest part of this whole contest. Electronic Arts' menu of possible selections reads like a list of famed PGA tournament sights. Eighteen of the world's finest courses are captured on disk, covering such U.S. greats as Pebble Beach, Augusta and Shinnecock Hills, along with a few overseas favorites, like Japan's Hirono and Scotland's revered St. Andrews. And if you're in the mood for something a little less familiar, *World Tour* also provides seven fictional courses to test your drive, ranging from the whimsical Goofy challenge, where a smile and a sense of humor are necessary prerequisites, to the damp and difficult Davy Jones layout, where rubber boots and a snorkel are suggested equipment additions.

An elaborate split-screen display is used to depict all the golf action. The left half gives a birds-eye view of the entire hole and its immediate surroundings. Your ball, represented by a small white dot, is accompanied by a movable cross hair, which can be used by the player to help aim his shot. The right half of the screen is again divided. The top quarter acts as a message board, where all the specifics of the upcoming shot are displayed. Pertinent factors such as the lie of the ball, wind conditions, distance to the green and current score are all posted.

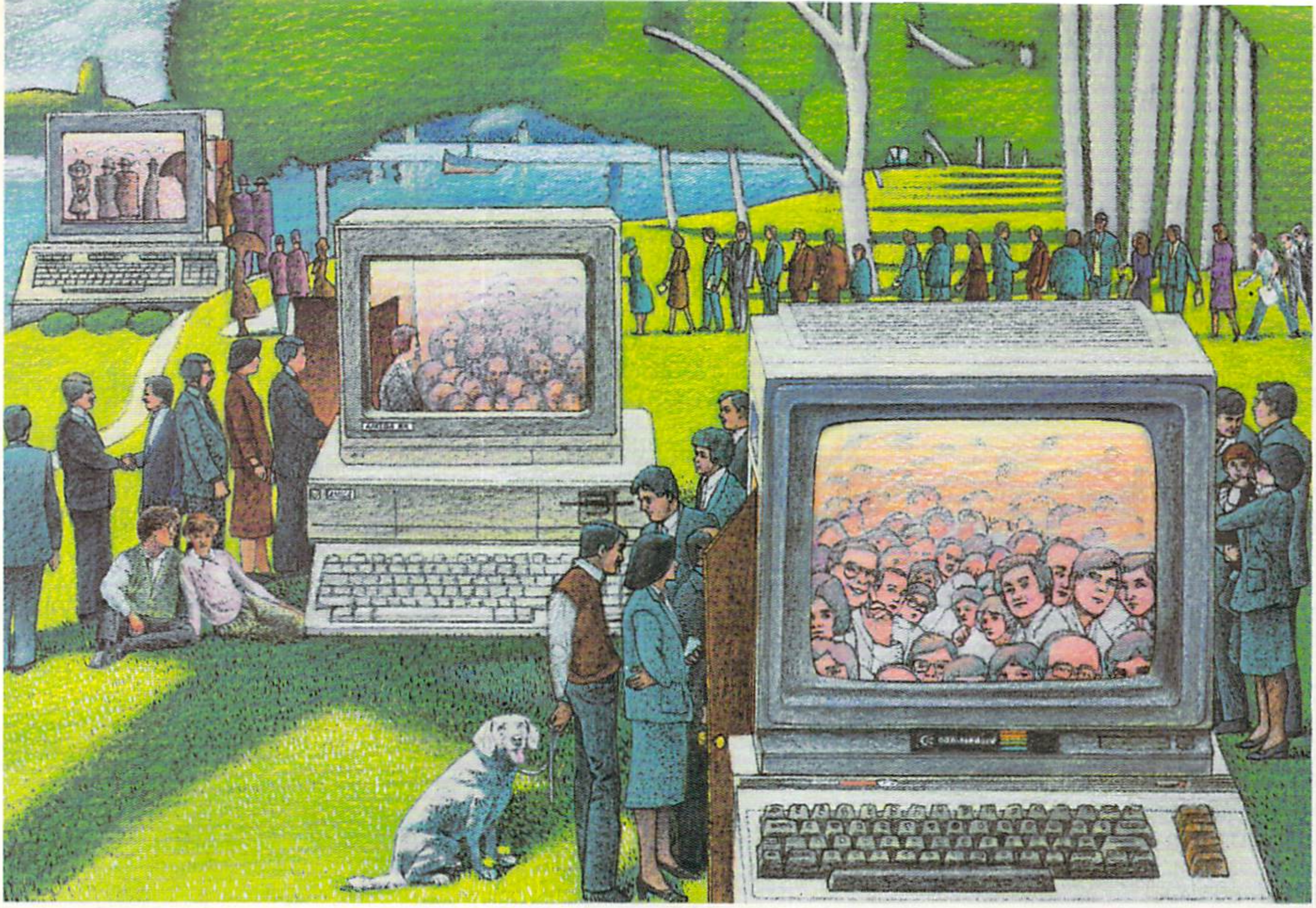
The remaining bottom section of this side gives a low angle three-dimensional view of the links, a perspective reminiscent of the one utilized by Access's *Leader Board*. From a position behind and slightly above your surrogate, you look out over the picturesque landscape that makes up the chosen course.

The graphic representations of the golfer and his environment are realistic and vividly detailed. Groomed blankets of green grass, beach-size bunkers and crystal blue streams compose the plush fairways. Out in the rough, weeds, trees, boulders, lakes and hills are among the obstacles that are set to add quick strokes to your scorecard. And off in the distance, a motionless flag stands alone, patiently waiting for your inevitable approach. When you finally reach the green, both sides of the visual display switch over for some isolated putting closeups so that you can better follow the fitness work of the player as he tries to tap his ball into the cup.

Your player's golf bag contains a full assortment of clubs. Three woods, ten irons and a putter are packed and ready, providing all the weapons needed to tame the terrain. As in real life, swinging your club requires smooth, coordinated movements, an exercise which is accurately simulated using a screen device called a Swing Meter. Appearing in the lower right-hand corner of the display, it looks like a sort of faceless clock, complete with its own variation of a sweep second hand.

By pressing the firebutton at the appropriate times, the player tries to set the strength and accuracy of the golf shot by stopping the quick moving hand as it crosses certain designated areas on the meter. Your on-screen character will then stretch into a fluid backswing and uncoil

Continued on pg. 82



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Reviewed by Gary V. Fields

Graphics Integrator 2/ Graphics Galleria

Computer: Commodore 64
Publisher: Inkwell systems
PO Box 85152 MB 290
San Diego, CA 92138
Medium: Disk
Price: $29.95/$24.95

You are probably asking yourself, "What the devil is a *Graphics Integrator 2* and why should I care?" I can answer the first question easily, but you'll have to decide on your own if it is a tool you would care to add to your C64 workshop.

In the years since the introduction of the C64, more than a few graphic programs have been released. Only the best have survived — because they had features appealing to the end user. But unfortunately, with few exceptions, the graphics created with or developed for one program were useless on another. This thorn, caused by the lack of a standard filing format, has caused suffering for the users of more than one graphic program. Unlike other industries which have agreed upon a uniform standard, the C64 graphic producers have never settled upon the best way to store graphics.

While the people at Inkwell have not established a standard, they have done the next best thing. *Graphics Integrator 2* makes it possible to convert graphics created by one product so they can be used by all the other popular graphic programs now on the market. Wait, I know what you are thinking. You're saying "that sounds great but if *Graphics Integrator 2* is marketed by Inkwell, you probably have to own their *Flexidraw* lightpen to use it." Wrong. While a lightpen can be used to activate the program's options it is only an option. All of *Graphics Integrator 2*'s options are just as easily picked via the keyboard.

Why would you ever need *Graphics Integrator 2*? Perhaps you've owned and used *Doodle!* (a joystick based graphics program) for years, but have recently purchased *GEOS* and have fallen in love with



Graphics Integrator 2 makes it possible to convert graphics created by one product so they can be used by other graphic programs.

geoPaint and geoWrite. Over the years you have created some pretty impressive graphics which you would like to incorporate in a geoWrite document. Or perhaps you are now editing a school newspaper using *The Newsroom*. Maybe a couple of the students helping with the publication want to contribute cartoons; one using *Super Sketch* and the other using *Print Shop*'s graphic editor. How do you convert those graphics into files *The Newsroom* can digest? Before *Graphics Integrator 2* you were just out of luck. Either you had to manually recreate those graphics or forget them. Now all you have to do is boot this program, follow the on screen instructions and as soon as the disk has stopped spinning the graphics are converted to *Newsroom* or *GEOS* formats.

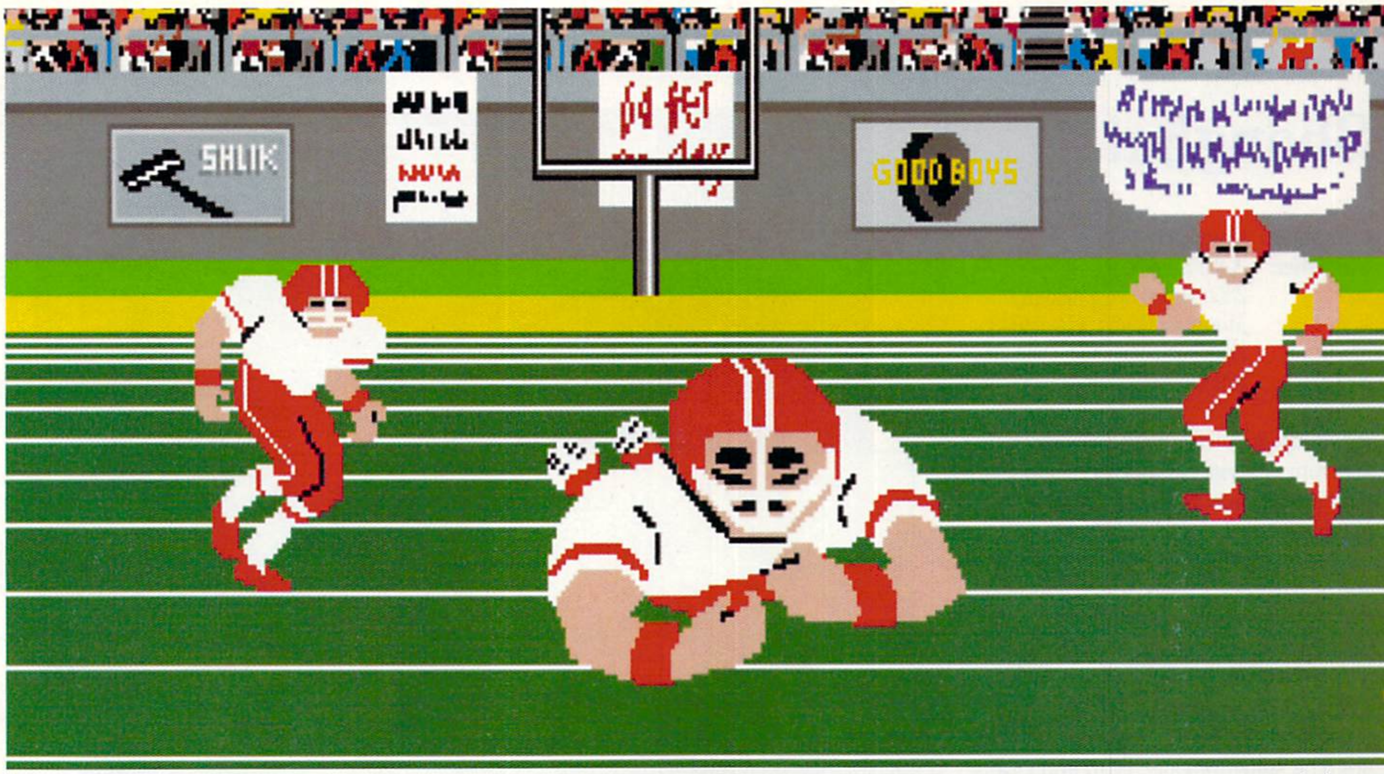
To make it easy to use, the program is broken into five modular programs which are selected from one menu. The menu options are: "Image Conversion," "Picture Printout," "Paperclip File Creator," "Slide Show" and "GEOS." To select an option you simply press the keyboard number it represents (or if you are using a lightpen, point to the box following the option). A 46 page manual comes with the program disk, but with few exceptions it is not needed because the on screen prompts are clear and nearly fail (not fool) proof.

The workhorse option is the Image Coversion module. It is here that files created by one graphic program are converted so they can be used by another. After it is selected a second screen will list the new options: "Load Hires," "Load Multicolor," "Load Graphics" or "Color Printer Driver." This is one of the few times you'll need to refer to the manual; it lists which programs use which type images. For instance, say you want to convert a graphic created with *Print Shop* for use by *Flexidraw*. All you would need do is select "Load Graphic." Another menu will appear listing the different programs by name, which *Graphics Integrator 2* can handle. Again, you make a selection by pressing the keyboard number corresponding to the option you want. All the modules follow this logical, easy to use, sequential method. When graphics are selected, they will appear on the screen so you can confirm that it is the drawing you want or return to the previous menu so you can select another. This step-by-step selection scheme is perfect for those with or without computer expertise. I've worked with dozens of utility programs which did wonderful, useful jobs, but none have been easier to use than this. This module design does have one drawback in that to move between modules you are forced to wait while the original options menu is reloaded into memory. This delay can be a bit frustrating if you are converting several graphics designed with several programs. Still it sure beats redrawing everything just to transport it from program to program.

The "GEOS" option converts graphics created by *Doodle!* to the *GEOS* format or the other way around. On first reading this may sound like only *Doodle!* graphics can be used. But that's not true since *Graphics Integrator 2* can convert any file to the *Doodle!* format. Apparently programer Dwight Phillips thought it easier for you to do a little extra work than recode the different modules. Since the inconvenience to the user costs only a few minutes, I didn't judge this omission objectionable.

Two options, "Slide Show" and "Picture Printout" have nothing to do with conversion of files between formats, but were apparently included in hopes of making the package more appealing to the buyer. It works. Slide Show allows the user to create an impressive onscreen graphic show using the drawings, pictures, charts, etc., stored on a file disk. Once the user se-

Continued on pg. 101



Amiga screen

SO REAL IT HURTS

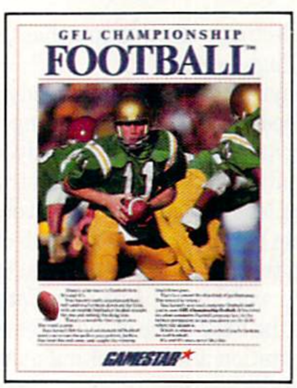
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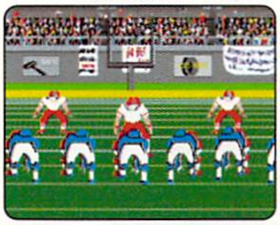


- *In-the-helmet perspective* puts you at ground level on the playing field.
- *Scrolling-screen animation* moves you up and down the playing field.
- *Realistic sound effects* let you hear everything from the quarterback calling the signals to the sound of your own footsteps.
- *Team selection screens* allow you to set the playing style of your team and that of your opponent.

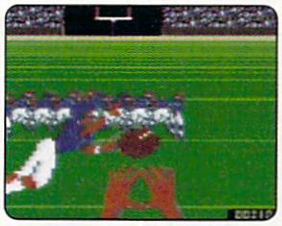
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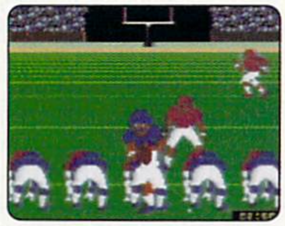
Look for Activision products at your local software dealer.
Or you can buy by mail at suggested list price by calling 1-800-227-6900.



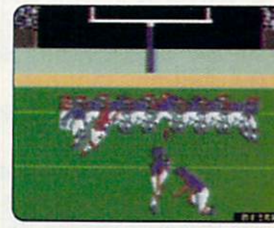
Amiga screen



Commodore 64-128 screen



Commodore 64-128 screen



Commodore 64-128 screen

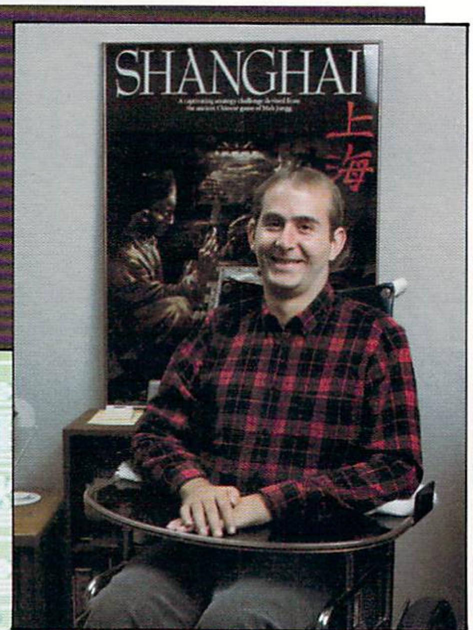
GAMESTAR™

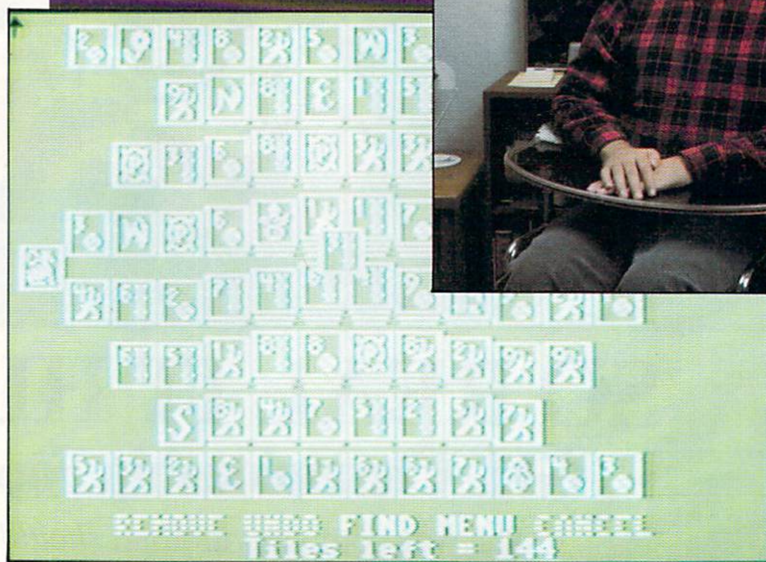
Reviewed by Russ Ceccola

Shanghai

Computer: Commodore 64
Publisher: Activision
2350 Bayshore Parkway
Mountain View, CA 94043
Medium: Disk
Price: $29.95

Shanghai is probably one of the most addictive games to come along since *Zork*.





Shanghai is the award-winning game from Activision based on the ancient Chinese game of Mah-Jongg. In it there are 144 tiles of visually different suits arranged in a dragon-shaped pyramid from one to five stacks high. The object of the game is to remove tiles in matching pairs until all are gone or you cannot match any more tiles.

The tiles are divided into three suits, plus Dragons, Winds, Seasons and Flowers. The suits are Dots, Bam and Craks. The suits make up the bulk of the 144 tiles in the formation, with four of each tile in the stack. Each suit consists of a characteristic figure and one of the numbers from one to nine, making up 108 suit tiles in all. There are twelve Dragon tiles: four each of the White, Red and Green Dragons associated with one of the three suits.

Sixteen Wind tiles, four Season tiles and four Flower tiles make up the rest of the stack, with different matching properties assigned to each. All tiles are matched with an identical one, except in the case of the Seasons and Flowers. Any Flower tile can be matched with any other Flower tile, even though they look different. The same goes for the Seasons.

Other than this rule, one needs to remember only that a tile has to be completely free to be removed. A free tile is one that is on a higher level than its immediate neighbors to the left or right. In other words, a tile can be removed if it can be slid out of the stack to the left or right. By using the joystick to point the on-screen cursor at a tile and clicking the button, you select a tile. Find a matching one and you're two tiles closer to winning the game.
one and you're two tiles closer to winning the game.

The player removes matching tiles from the board by highlighting both of them and then choosing the REMOVE option from the on-screen menu at the bottom of the screen. A quicker way to remove the pair is to click the joystick button twice when selecting a tile that matches the tile already highlighted.

By playing the game you already have succumbed to the automatic lulling effect that *Shanghai* exhibits on the player. Focusing entirely on the screen and the goal of a completely decimated stack, you just can't help being caught in the web of relaxation that *Shanghai* spins. You can let the mind wander while playing *Shanghai* because the bulk of the game relies on visual recognition and unthinking movements of the joystick.

Addictiveness enters into play after the first session of *Shanghai*. If you play a random dragon formation rather than one of the saved formations that has a solution, you probably won't remove all of the tiles. Randomness easily causes necessary tiles to be placed innocently at the bottom of a tall stack of tiles, far beyond the reach of the matches that you have at your disposal. This loss to the "dragon" only provokes another go at it. You play again and again and soon find that an hour or so has passed and all prior memories have left your mind.

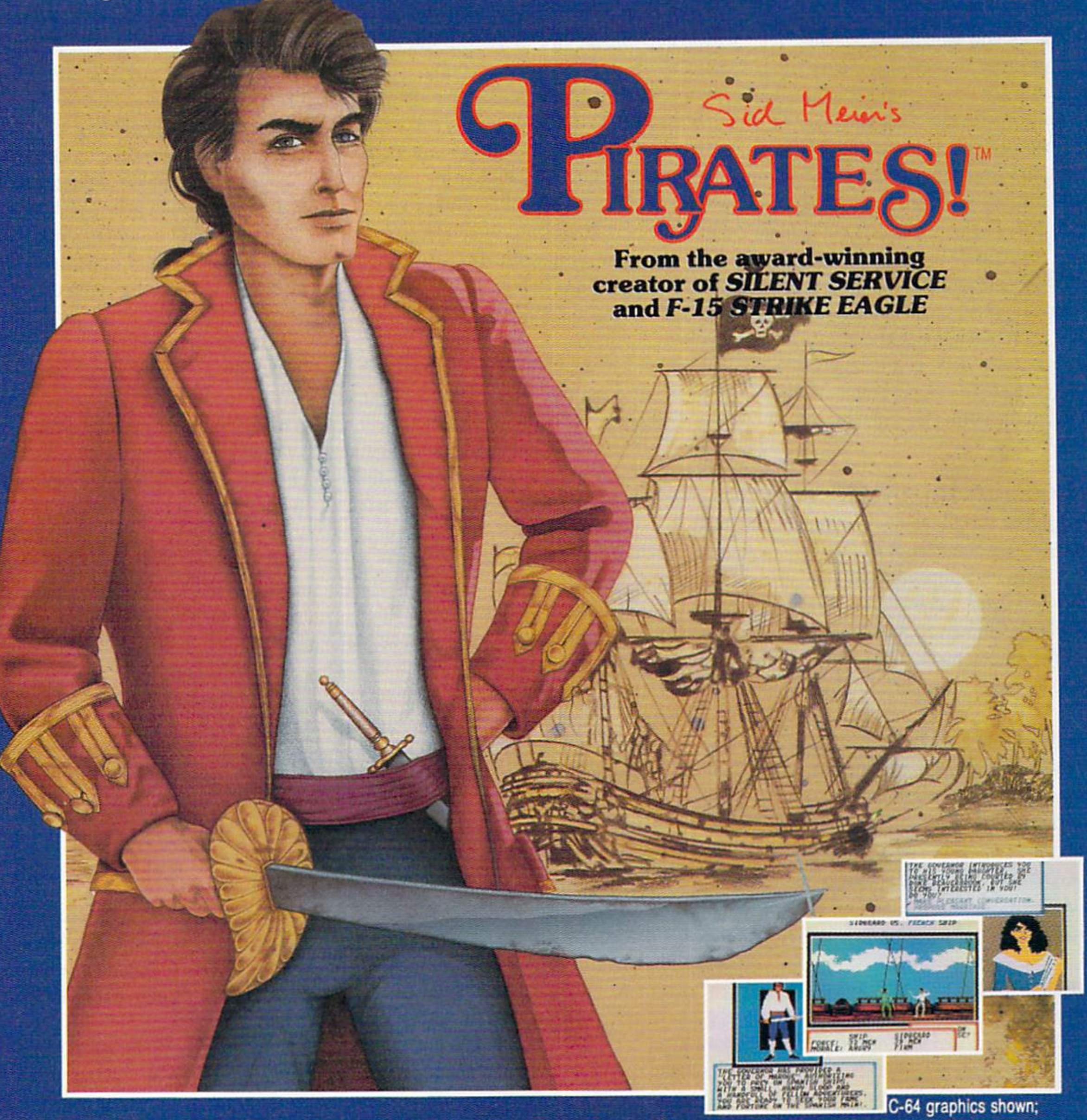
Based on the Oriental game of Mah-Jongg, a game played on long voyages and in the 1920's Prohibition era, *Shanghai* does Mah-Jongg one better. The original game was similar to gin rummy, with four players trying to make a hand from the removed tiles. Designer Brodie Lockard took a new approach, with the goal of *Shanghai* being to remove all of the tiles from the screen.

There are four modes of play which add to the attractiveness of the *Shanghai* package. Solitaire mode is for one player with no time limitation on the game. Team Effort allows any number of players to take turns in finishing a game. Tournament mode allows any number of players to compete in removing the most tiles from the stacks. The top five scores are recorded to the disk. Finally, Challenge mode puts a time limit on finding a match, while limiting the game to two players. The players take turns in working on the same dragon formation and finish their turn by removing two tiles or running out of time. The player who has removed the most tiles at the end of the game is the winner.

These playing modes offer spice to *Shanghai*, while other options in the

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C-64 graphics shown; Actual screens may vary.

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Continued from pg. 30

menus offer help. A PEEK command allows you to remove tiles without matching them, yet you automatically lose the game. FIND shows you all available matches, and UNDO replaces as many pairs of tiles as you want back to the stack. Games may be saved midway for play later, and there is a good selection of saved formations on the disk that can be won for those in need of encouragement. All options are chosen with the joystick.

Shanghai offers so much to the gamer yet takes little effort to enjoy. The simplicity of play, coupled with the variety of ways to tackle a dragon formation, is a breath of fresh air in a software world dominated by true-to-life simulations and 100-page manuals. Just remember to go first for those four tiles that block most of the formation and you can't go wrong!

Lockard Interview

I recently had the pleasure to speak with the designer of *Shanghai*, Brodie Lockard, a man as interesting as the game. Lockard is 26 years-old and lives in Redwood City, California. At nearby Stanford University he designs educational software for use in university classrooms.

Originally introduced to Mah-Jongg by a friend, Lockard thought that a variation of the game would translate well to a personal computer. After a year of weekends and evenings devoted to the design, the result was *Shanghai*. The success of *Shanghai* has made all of Lockard's efforts worthwhile. The end result is personal satisfaction for Lockard in his first attempt at entertainment software programming.

What makes Lockard's design even more remarkable is the fact that he is a quadraplegic. Injured in a varsity gymnastic accident while an undergraduate, Brodie fought against his paralysis and overcame his disability by using talents that most of us will never use. Lockard programs with a mouthstick and a specially designed headset which hooks up to his computer. Despite Brodie's accident, his programming talents and penchant for personal computers have outshined his disability and have established him professionally in software design.

Ceccola: Brodie, tell me about your background and how you got interested in computers.

Lockard: I was always interested in Mathematics and English in high school and really didn't get interested in computers until I was in college. I started out as an English major and realized after a while that it might be tough to find a job, so I started looking around for something that might be more marketable. I took one programming class and liked it a lot, so I took one or two more and did some programming the summer before my accident. After the accident it was something I could still do. Programming motivated me and gave me something I could look forward to every day. Programming took my mind off my disability and gave me the incentive to get out of the hospital.

Ceccola: How long did it take you to get out of the hospital? Did you get more seriously involved in programming while there?

Lockard: I was in the hospital for nine months and actually was able to do some work on the Plato system from Control Data Corporation. One of the company's sales representatives lent me her own terminal for several months of my stay in the hospital. When I started classes again after the nine months, Control Data Corporation lent me another terminal that I could use at home. I used the system throughout the rest of my years in school and it influenced me a great deal in that I could do things I hadn't thought I would be able to do. Specifically, I decided to do my graduate work in Interactive Educational Technology, since the Plato system is an educational one.

Ceccola: Let's talk about *Shanghai* now. How did you get interested in Mah-Jongg, the idea behind *Shanghai*?

Lockard: I really only played Mah-Jongg twice—at a friend's house. It's a lot more complicated than *Shanghai*, more like gin rummy. I enjoy playing it, but I didn't think it was easily adaptable to a computer.

Ceccola: So you developed *Shanghai* from the basics of Mah-Jongg?

Lockard: Not really. A friend showed me how to play *Shanghai* before it had a name, about seven years ago. We actually played with tiles that were stacked, and I thought it would work great on a computer.

Ceccola: What actually prompted you to go ahead and decide to design a video game?

Lockard: I had been thinking about it for a while, and after designing a successful version on the Plato system I thought about designing *Shanghai* on personal computers that most people might have. I wanted to do that for a while but had no experience in programming micros. When I started working at Stanford, I was able to use a Macintosh and decided that the machine would be a great one to start on.

Ceccola: How did you develop a relationship with Activision?

Lockard: When I was looking for a job in early 1985, one of my resumes made its way to Brad Fregger at Activision. He called me up and said "Let's talk about software." We did and he told me that if I ever had any ideas to give him a call. I had just started on *Shanghai* and really didn't know how it was going to turn out or if I was even going to finish it. In December I had a nearly finished product and called Brad. He was interested and quickly got other people at Activision interested and gave me hints on how I could enhance the game.

Ceccola: *Shanghai* took away most of your free time for a year or so. How difficult was it to devote all of that time and do you ever regret it?

Lockard: I definitely do not regret the devotion I gave to *Shanghai*. It's true that it did take most of my time to design the game, but at the end of the year I could look back and say that I had really accomplished something that year. It gave me something to look forward to whenever I had a little free time.

Ceccola: Do you have any tips for playing *Shanghai*?

Lockard: There is a fair amount of randomness involved in the game, so a lot of luck is necessary. I also included some tips in the Strategy section of the manual for *Shanghai*. These cover most of the rules that I play by.

Ceccola: There are different tile configurations that come on the *Shanghai* disk, with names such as Summer, Crak's Row and Many Winds. What do these names mean?

Lockard: We tested each of those saved configurations to make sure that all tiles could be removed and then gave them a name based on the tiles that are showing or those that are key in winning the game.

Ceccola: What can you tell us about any future designs that you may have in the back of your head?

Lockard: The best I can say is that I have a few really good ideas. I wish I could say more, but I haven't been actively programming anything new, and ideas are all that are available right now.

Ceccola: If the right idea came along, would you jump right in or would you take your time to finish the design?

Lockard: I don't think I'd waste time but rather go full force at any project I had in mind. That's the way to get things done! ■

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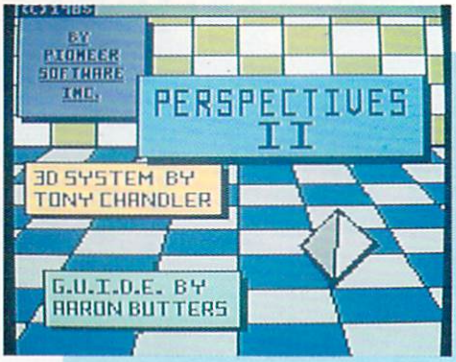
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Reviewed by Gary V. Fields

Perspectives II

Computer: Commodore 64
Publisher: KIRA Corp.
P.O. Box 129
Kutztown, PA 19530
Medium: Disk
Price: $59.95

With *Perspectives II* you can draw any thing from a simple box to a complex spaceship in three-dimensional perfection.



Perspectives II is a different kind of graphic program for the 64. Unlike most other drawing programs which display two dimensional drawings, this one constructs three-dimensional graphics. Plus, once drawn, the objects can be rotated and tilted so you can display them from any imaginable view point. An option is also included for drawing in stereo, so the graphic will appear to project out into thin air if you view it through a pair of those old red and green 3-D movie glasses.

With *Perspectives II* you can draw anything from a simple box to a complex spaceship in three-dimensional perfection. Once finished, you can rotate and view the object from any distance, angle or elevation using any combination of colors. If you are satisfied with the drawing you can either save it on disk for future use or dump it to a printer for hard copy.

A constant status line displays four categories: HELP, SYSTEM, 3-D AND DISK. When the on-screen arrow is pointed to one of these words and you activate the pointing device (e.g. click the mouse, press the joystick's fire-button), a window will open listing the options available. Activating HELP does just that — lists helpful instructions on how to use each of *Perspectives II's* options. The DISK window allows you to take care of disk house-keeping chores like formatting a disk and renaming or scratching files. The SYSTEM and 3-D windows are where all the fun and power is found.

Objects are created by activating the 3-D window. The first option listed is called DRAW. When it is activated the screen is divided into equal quadrants. Three of the quadrants show the object you are drawing from above, face on and from the side. The fourth quadrant displays the status of the lines being drawn. This is where *Perspectives II* differs greatly from most drawing programs.

Most graphic programs would allow you to simply point where you want a line to begin and then stretch the line across to where you want it to end. Most also support options which quickly draw circles, boxes and rays. *Perspectives II* includes none of these. Because the objects drawn here have not only surface dimensions but depth as well, you must construct lines differently. The designers decided that the easiest way to do this was to have the user pick three reference points (X,Y and Z) for each line. Because the screen displays your drawing from above, front and one side, when you decide where a point will appear on the top, you also have to decide where it begins and ends on the front and side views. The X and Y coordinates pinpoint where the line begins in one view, while the Z coordinate spots the same point in depth. You select these points by increasing the number value beside the letters X, Y and Z and as you change the value with your input device, the line is drawn automatically on the screen. This means you draw three views of the object simultaneously. Lines can be drawn continuously or have different origin points and can be shown as solid or broken lines. Broken lines would normally be used to display interior detail which could not be seen from the outside, like supports, shelves, etc.

After you have drawn an object, you can view it at any distance and from any angle by selecting the Change View option. The easiest way to understand this option is to visualize yourself as floating in space. You would then have the freedom to view an object also floating in space at any distance and from any angle above, below or behind. If you are using *Perspectives II* to design objects which you intend to construct, this option gives you a chance to spot design flaws and correct them before wasting material and time. You can also dump each view to a printer for hard copy. Thus you could view the object from one angle, dump in to your printer, then rotate it and dump the new display.

A Film Studio option lets you create "film strips" with your drawings. With it you can design an object, capture it in memory, then move or rotate the object and capture the new view in a different memory location. Each view can then be recalled sequentially and quickly, which makes the object appear to rotate, move and change like characters in a television cartoon. The film strips can also be saved to disk and are perfect for display purposes or video illustrations.

The System functions allow the user to save screens, dump information to a printer, change the size of the display, select the input device and custom select printer combinations.

Drawings can be created using either a joystick, mouse, light pen or Koala Pad. This means you are free to use the device you find most comfortable. I personally prefer a light pen, but I tried all the devices (except the Koala Pad) and found all worked well.

The printout option supports most printers including Commodore, Prowriter, Gemini, Legend, Okidata, Panasonic, Riteman, etc. and the more popular interfaces. I also found that it worked perfectly with my old NEC 8023 printer (even though it is not on the support list) when the Prowriter option was selected.

This is one product (unless you are an architect or engineer) you probably won't be able to master simply by trial and error. If you want to use *Perspectives II* be prepared to not only read the manual, but to study it from table of contents through to the last page of the glossary.

Perspectives II is impressive looking, but the question you need to answer is, "what use is it to me?" The first time I powered up *Perspectives II* I was remind-

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Reviewed by Mark Cotone

Fleet Filer

Computer: Commodore 64
Publisher: Professional Software
51 Fremont Street
Needham, MA 02194
(617)-444-5224
Medium: Disk
Price: $39.95

What makes this file system so fleet? The secret can be found in the program's design, an increasingly popular arrangement in which all data, including the program itself, is stored in computer memory. This type of RAM warehousing makes informational access extremely fast, since no time is wasted going back and forth to disk every time you need to search for or add to an individual record. You simply load the entire data base into memory at the beginning of your work session, make all the necessary observations and adjustments, and later save the file back to disk in one quick operation.

The obvious pitfall to this storage design is the disastrous effect a power failure would bring about, since everything in memory would then be irretrievably lost. So, even if you keep up on your electric bill and stay out of lightning storms, the more cautious of you will still want to save your files a couple of times during any extended stint—just to be on the safe side.

A quick look under this package's hood uncovers some impressive stats. A *Fleet Filer* record can contain up to 255 characters divided among a maximum of 20 text/numeric fields, with a file holding up to 5,000 records at a time. Of course, this final figure is advertised to represent the program's maximum load, but even with practical sized records cutting that number in half, there's still a fair share of available space—more than suitable for most home applications. To help you keep track of how quickly you're reaching the memory limit, there's an on-screen counter tallying how many records you've already accumulated, along with an accompanying meter gauging the number of screen characters still available. If you find that space is getting scarce, files can then be subdivided and saved to disk under separate titles.

Fleet Filer's operational speed is perfectly complimented by a menu-driven design that puts the package's quickness to good use. All the major features needed to keep your files neat and organized have been included and can be accessed with a single keystroke.

> *Fleet Filer's* speed is complimented by a menu-driven design that puts the package's quickness to good use.

When trying to define a database structure, users will surely appreciate this program's flexibility. To allow maximum data compression, the text field length has been left open-ended and may contain as many letters, numbers or punctuation marks as desired so long as it does not exceed the character limit of the record. Numeric fields, designated as such when calculations, searching or sorting of numberic data is anticipated, can extend up to 5,000,000,000, with a maximum of two decimal points allowed. If you ever find that the parameters of the program need to be amended, a separate command has been included to make deletions, additions and changes of field names a simple chore.

Utilize the search and sort functions of *Fleet Filer* and you'll really see it strut its stuff. Both operations are performed almost instantaneously, a far cry from the old whirling disk exercises we've all waited through in the past.

Search strings can be based on the criteria found in any number of fields appearing on the screen. Aside from the more direct search operations, where the program will riffle through the files to find a specific word or name, *Fleet Filer* also performs partial searches. The equals sign can be used as a wild card symbol, so that "=may" will recognize "*May*flower," "*may*hem" and "*may*or" as matches, and a single unknown character can be replaced with a question mark, so that "s?n" will match "*Sun*day," "*sin*cere" and "ar*son*." It is also possible to search according to logical criteria, with the < and > symbols used to find characters or numbers smaller than (before) or greater than (after) a specific point.

Using the sort function is like having the world's most competent file clerk on call, one who will quickly group your records in ascending or descending alphabetical or numerical order at a moment's notice. When the command is actuated, all the field names will appear on-screen. You then designate which ones will be the keys to your sort, listing the criteria in order of consideration.

When it comes time to obtain a printed copy of one's records, the user is responsible for setting the parameters of *Fleet Filer*'s output, designating everything from page length to the number of spaces skipped between records. With a dozen or so design variables available, a full array of formats can be constructed.

This process of personal page construction, although very accommodating, is the most involved section of the program, and might tend to be a bit confusing for the uninitiated. Professional Software provides some assistance with clear documentation and on-screen messages to help pull you along. Still, a user may experience an initial period of struggle until the function becomes familiar. But in the end, it's a small price to pay for the formatting freedom that will soon have you creating just about every page design you could possibly need.

While it's easy to be drawn to *Fleet Filer*'s quick and simple style, users are certain to be equally impressed with this package's thoroughness. For example, the user's manual not only gives a clear and complete introduction and instructional rundown, it also provides a ten-page step-by-step tutorial overview of their program, just in case you're new to the database field and need an initial orientation lesson.

For those of you who own any of the *Fleet System* word processors, you will be happy to know that data and informational files can be created on any of those programs and still be used with this data base. It's a great time-saving option if you're trying to merge a list from the *Fleet Filer* into a personalized letter in *Fleet System* or almost any other program, for it can all be done without any retyping of data. This attention to detail—that little extra effort that facilitates operations for the filing fingers—is the type of package addition that can quickly build an appreciative audience.

With *Fleet Filer*, users can experience the best of both worlds. By delivering blazing speed without sacrificing program power, this fast and efficient package will make short work of all your filing needs. ■

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Weekly Reader Sticky Bear Software

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AMERICAN COVERS

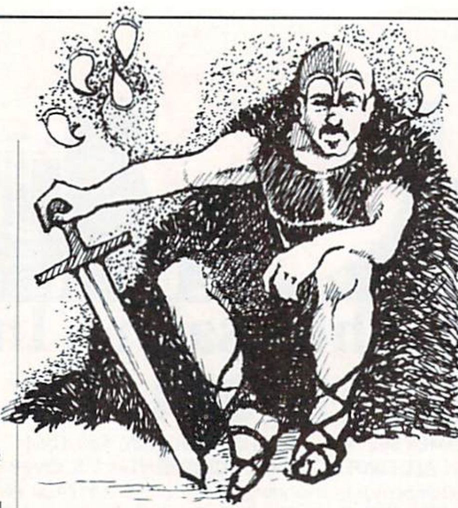
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OTHERS AVAILABLE CALL FOR PRICING

by Shay Addams

Nikademus Gets Nasty in Phantasie III

News and opinion from a leading explorer of those fantasy realms called adventure games.



SUSAN LIPPMAN

I must have slain 10,000 monsters since January, but every time I turn around there's another orc swinging a broadsword in my face or an evil wizard throwing everything in the spell book at me. Just when I thought I'd cleaned up the lands of Gelnor and Ferronrah in Winston Douglas Woods' *Phantasie I* and *Phantasie II*, he sends me packing to Scandor. This time my target was Nikademus, the main source of evil in this fantasy world.

While I faced Nik's henchmen in the first two games, in this one I had to track down and defeat the wayward wizard himself. Besides exploring Scandor and its dungeons, I journeyed through the Planes of Light and Dark, and the Third Level of the Netherworld (the first two levels were part of *Phantasie II*). You can use characters developed in either game or start with fresh ones. Starting with fresh ones is better since existing characters lose most of their abilities and gold.

Though there were few changes between the first and second games, *Phantasie III* profits from several enhancements. Fans of the series will be ecstatic to hear that the program's time-consuming routine for distributing items, weapons and gold—which forced you to reassign *everything* owned by the party in order to trade even a single weapon or other object from one member to another—has been replaced. Now you can trade things directly among the characters.

A more radical invention surfaces in the expanded combat system. Besides losing hit points, a character might suffer damage to one of six body parts. A stick figure shows the condition of each character's arms, legs, head and torso. When sliced with a broadsword, he may lose an arm as well as some hit points. In that case, he may not even be able to continue the fight. Body parts, besides being damaged or chipped off, may also be broken. Monsters suffer body damage, too. There are only two new spells, but bows are introduced for long-range attacks.

The graphics and interface differ slightly. You see the aerial view of the land in a small window on the left (which simplifies mapping) and the monsters and party appear on the right. They are larger and much better animated this time around. The joystick interface remains as convenient as ever. Tactics and planning have become more important in this battle-intensive game, which does not have as many puzzles as the previous ones.

Interactive Comics

Though they don't officially call *Accolade's Comics* an adventure game, Accolade refers to it as interactive comics. It's the story of secret agent Steve Keene, whom you play in this one-of-a-kind story that brings the comic book look to the computer screen. After the first panel appears, you punch the joystick button and watch the next one plop down beside it. Up to four panels fill the screen, then you start over with the next batch by "turning the page."

There is no parser. A character's dialogue fills a balloon over his or her head; when the words are shown in white type on a black balloon, you can move the joystick to cycle through a series of alternate decisions in the balloon and press the button to choose one. Occasionally you can manipulate something in the picture, such as when you decide whether to enter a building's door or window by pointing an on-screen arrow.

As a result of this menu-driven interface, your interaction with characters and objects is limited. You don't really solve problems but must focus on trying to choose a successful path through the game's decision points. The real obstacles to success are manifest in the form of videogames that block access to certain areas. That's right— slow videogames that look like ideas rejected by Activision five years ago. I like action games as much as anyone, but these are so flimsy that I didn't bother trying to get past any of them.

The game offers a fresh look and some original ideas, plus lots of kinetic spot animation and plenty of graphics, which take up both sides of three disks. But the scenario is too schizophrenic, for *Accolade's Comics* is unable to make up its mind whether it wants to be an action game or an adventure.

Ultima Update

Richard Garriott, best known as Lord British to countless *Ultima* fans, revealed a couple of surprising developments. While finishing up *Ultima V*—which will be twice as big as *Ultima IV* and offer even more intricate character interaction and sharper graphics—he is planning a whole new game system. Its working title is *Pirates*. (*Ultima* will continue, so don't panic.) He says the new combat and magic system for *Ultima V* is as much fun to play on paper as on the computer, so it will be marketed as a traditional role-playing game along the lines of *Dungeons and Dragons*. That means you'll be able to play *Ultima* with friends for a change.

And when the on-line version of *Ultima* is ready, a multiple-player game will be available to anyone with a modem. The program allows one computer to moderate a game, while the players communicate their orders via the phone lines. Graphics for the game are stored on each player's disk, much the same way Q-Link graphics are presented, which speeds up the action. Garriott foresees a time when every city can have at least one ongoing *Ultima* campaign, and the possibility exists for putting the game on a major on-line network.

Another exciting development concerns the immensely popular role-playing game *Advanced Dungeons & Dragons*, the original inspiration of all such games. Strategic Simulations has worked out a deal with TSR to publish at least ten different role-playing and several action games that will be available for the 64 and Amiga. The licensing agreement will span five years, and the first games should be out in early 1988.

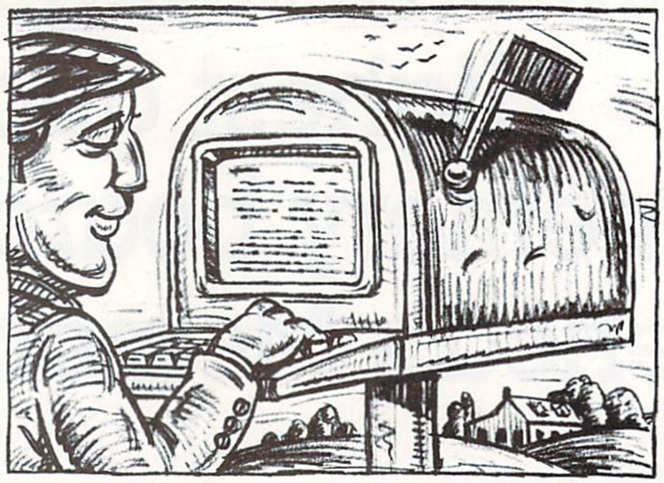
I haven't seen it yet, but Electronic Arts' *Legacy of the Ancients* sounds like a winner. It was written by Chuck and John Dougherty, who did *Questron*, and several

Continued on pg. 83

by Robert W. Baker

Inside Q-Link

Explore the inner workings of the Q-Link telecommunication service with network pro Bob Baker.


JIM OWENS

Back a few issues I gave a few hints on how to use E-Mail more effectively. Well, here's a few more little tidbits concerning E-Mail that may be of help.

First, whenever you enter the E-Mail menu to read waiting mail, it may help if you remember not to display any long messages from the message boards immediately before going to the E-Mail menu. The reason for this is that whenever you display a long message, there will be a group of flashing up-arrows in the lower right-hand corner of your screen. These arrows normally serve as a reminder that there is additional text beyond what is currently being displayed. However, this indication stays on the screen as long as the message is displayed. The arrows even stay on the screen when you press any of the function keys and bring up various menus.

The problem is that the arrows completely obscure the mail flag if you have mail waiting. However, by remembering not to leave a long message on your screen before entering the E-Mail menu, the arrows won't get in your way. Alternately, you can keep checking for waiting mail until the system informs you there is no more mail waiting.

On the other hand, leaving a particular message on your screen can sometimes be very handy. If you've read a certain message that you're interested in and want to respond via E-Mail to the author, you can usually leave the message on your screen while entering the E-Mail menu. The message text will still be on your screen, where you can refer to a limited portion for reference while writing your mail message.

Also, don't forget that until you actually delete a displayed E-Mail message by pressing F5, you can use the F7 menu option to answer that message any number of times. There's no need to remember the author's id and originate your own message; the system will take care of it for you as long as the message is still displayed.

The current E-Mail system does have various limitations, and could easily be enhanced in a number of ways. Even so, it's still an easy to use, effective communications media. I only wish E-mail used the same editor as used within the message boards—it would sure make life easier online. Hopefully, the next generation of Q-Link software will include enhancements in this area.

In the June issue, I discussed some of the Amiga support available on the system even though you couldn't log on with an Amiga yet. Well, SYSOP PJ provided some handy information concerning CP/M support for the 128 that is available on Q-link too—there are a number of CP/M download files available in various libraries created specifically for CP/M.

Since Q-link doesn't allow downloading CP/M files directly to a CP/M disk, you'll need to use one of the various Commodore-to-CP/M format translators that are available on Q-link. A large number of utilities are available in the CP/M libraries, but SYSOP PJ recommends using one of the following programs.

fix.cpm271.168	Uploaded by LERoseman
xlink2.1-128.lbr	Uploaded by SYSHELP PJ
rdcbm21.lbr	Uploaded by SYSOP PJ

All three of these programs require the use of one or two disk drives that must be either 1541's or 1571's. Any other drive will not work correctly with these programs. An 80-column monitor for your 128 is also required for these programs, since they only run in 80-column mode. Fix.cpm271.168 was one of the first translator programs designed to transfer files that were downloaded on a disk in 64 or 128 native modes. The files that are intended to be processed with this program should be downloaded in sequential format; program files are not handled properly. Also, two disk drives are highly recommended when using this particular program.

The first step in using fix.cpm271.168 is to format a CP/M single-sided disk using the normal FORMAT.COM program that came with your 128 CP/M. Next, load fix in your drive 8 and place your formatted CP/M disk in drive 9. Then load fix.cpm271.168 and follow the prompts. You'll be asked the name of the file to be transferred and the name you want it to be on the CP/M disk. After answering all the prompts, just hit RETURN and your file will begin to be transferred.

If all goes right, you'll see a series of dots going across the screen as your file is transferred. You should be aware, however, that there are a few drawbacks to using this program: it is very slow and is limited to transferring a total of 168K of data.

The second utility, xlink2.1-128.lbr, is a unique program by Miklos Garamszeghy that does a number of different things. It can convert from PetASCII, ASCII to PetASCII, program (with and without screen codes) to ASCII, 128 CP/M single- and double-sided to sequential, and the reverse, plus IBM PC DOS (9 sectors per track) to 128 CP/M.

After you download this file from Q-Link, the original files must be extracted using the Library v1.3 utility before they can be used.

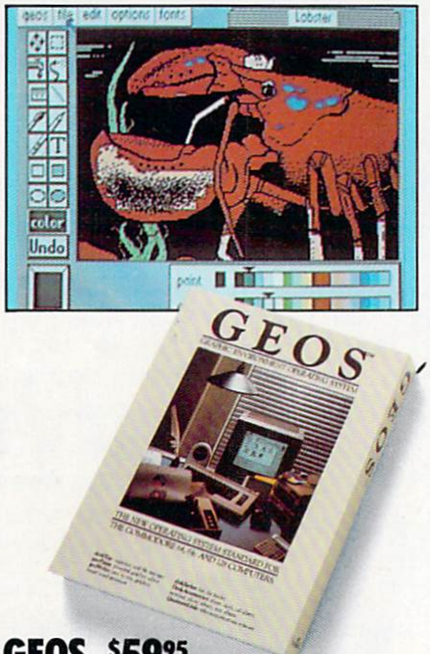
As with the first utility, any files that are to be transferred to a CP/M disk must be in sequential format for this program to function properly.

When you load and run xlink, it presents you with a menu asking what you wish to transfer. After choosing the option to transfer sequential to CP/M, the program will prompt you when to change disks. It works quite fast with a 1571 drive, but it is limited to transferring files no larger than 45.5K (approximately 183 CBM blocks).

Finally, rdcbm21.lbr was written by Rob Tillotson of Turbo Penguin Software and is in the public domain along with all the programs mentioned here. Rdcbm is a transient CP/M program and must first be

Continued on pg. 98

IF YOU STILL THINK CO
PLAY AROUND



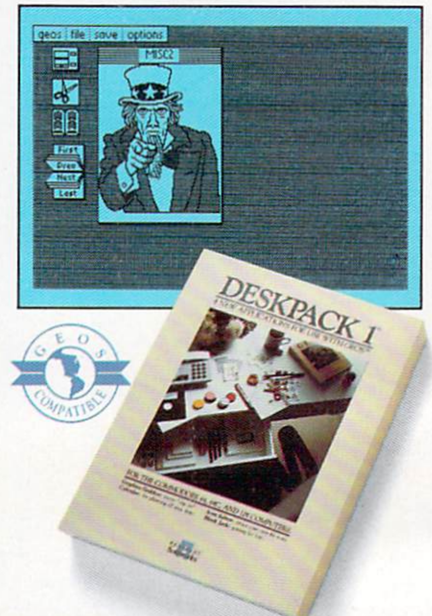
GEOS $59⁹⁵

The Graphic Environment Operating System that opens up a whole universe of new possibilities for Commodores. With geoWrite, geoPaint, fast-loading diskTurbo and support for all GEOS-compatible applications.

FONTPACK 1 $29⁹⁹

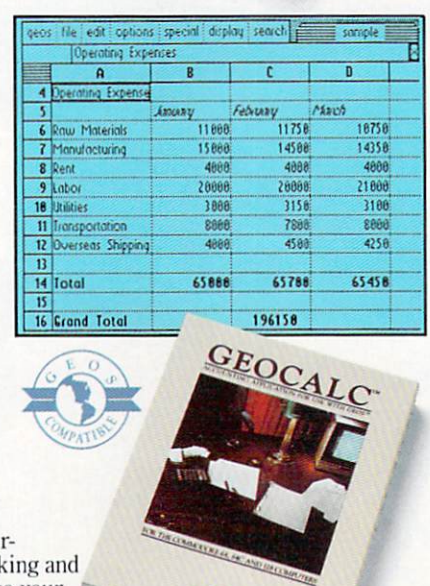
A collection of 20 more fonts for use with GEOS applications, in various shapes and sizes for more expressive and creative documents.





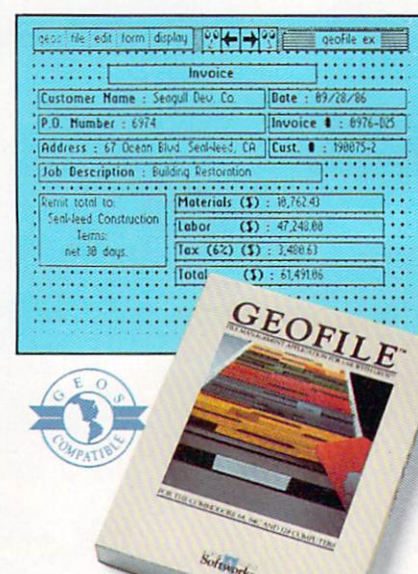
DESKPACK 1 $34⁹⁵

Four GEOS-compatible applications: Graphics Grabber for importing art from Print Shop,™ Newsroom™ and Print Master™ graphics; Calendar; Icon Editor and Black Jack Dealer.



GEOCALC $49⁹⁵

The GEOS-compatible, number-crunching spreadsheet for tracking and analyzing numerical data. Create your own formulas, perform calculations for anything from simple geometry to "what if" cost projections.



GEOFILE $49⁹⁵

The GEOS-compatible database manager that sorts, edits and prioritizes whatever data you feed it. You fill out the "input form," specify your command, and geoFile takes it from there.

by John Iovine

Interfacing Commodore's User Port, Part 5

This month we build an appliance controller for the Commodore 64, 128 and VIC-20.

Introduction

In previous parts of this series, the concentration has been on interfacing +5 volt TTL (Transistor-Transistor Logic) devices to the user port. With these devices, the computer could sense, display, speak or make some form of decision. The limitation however was that the computer could not directly affect the real world environment.

Real World Environment

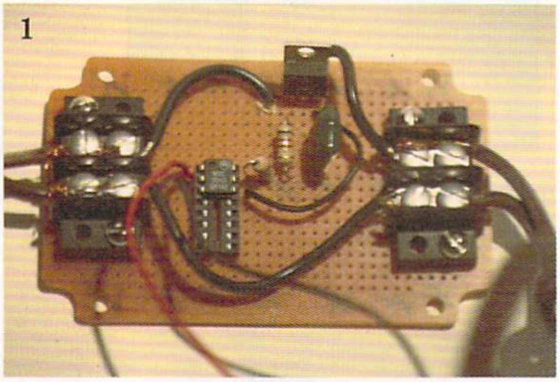
The 'real world environment' is where we live. We have equiped the computer with sensors that can partially inform the computer of our environment. Now it is time to equip the computer with control devices that allow it to effect the real world.

In this part of the series we will employ the user port to control high power electrical devices. By using the TTL voltage (+5 v) on a PB line of the user port, the computer will be able to turn on or off electric power. The circuits described control either standard 115VAC electircity from your home or DC electric. Naturally, by controlling the electric current to a device we are therefore controlling the device.

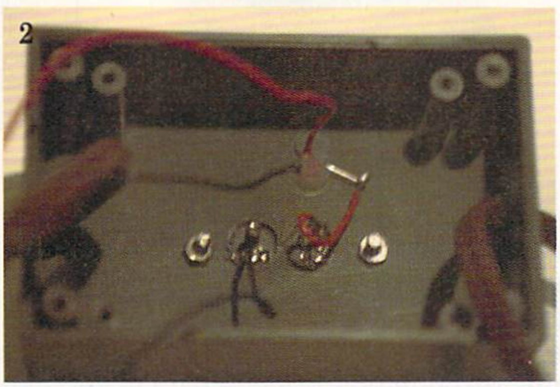
You can use these circuits to control any number of household appliances. In addition, by utilizing the sensors from Part three we can program the computer to impact directly upon the environment based on sensor readings. This could be something as simple as turning on a light when the computer senses dusk or someone walking into the room.

For our example, however, we will interface the toxic gas sensor from Part three, and make an automatic ventilation control system. The operation of the system is simple. When the computer senses a toxic gas it will turn on an electric fan and keep it on until the gas concentration returns to a safe level.

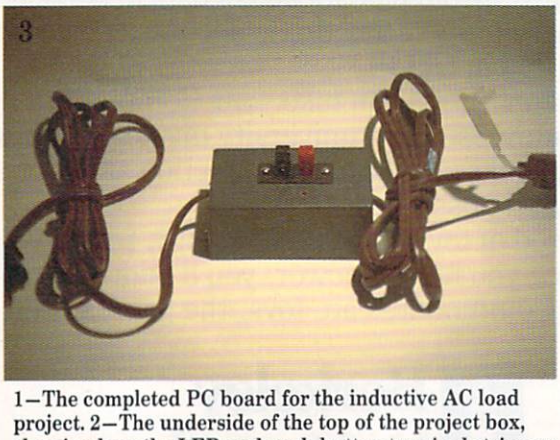
1



2



3



1—The completed PC board for the inductive AC load project. 2—The underside of the top of the project box, showing how the LED and push-button terminal strip are wired. 3—The completed project with both halves of the extension cord connected and the box fully assembled.

Inductive and Resistive Loads

Any device we are powering or controlling is called a load. And, whatever the electrical device is, it will fall into one of two main electrical categories; inductive or resistive loads.

It is pretty easy to distinguish an inductive load from a resistive. An inductive device, such as a motor, transformer, relay or solenoid, has coils or electrical wire windings in it. A resistive device, such as an electric light (not fluorescent), coffee maker or heater, doesn't have any coils or windings. The distinction between loads is important because, when electric power is turned off to an inductive device, an electric pulse (transient) is generated. This electric pulse must be absorbed by a capacitor-diode combination in our circuit. Failure to absorb this pulse may damage our circuit or computer. Fortunately, adding the capacitor-diode is very easy to do, as our circuits illustrate.

You can use these circuits to control any number of household appliances.

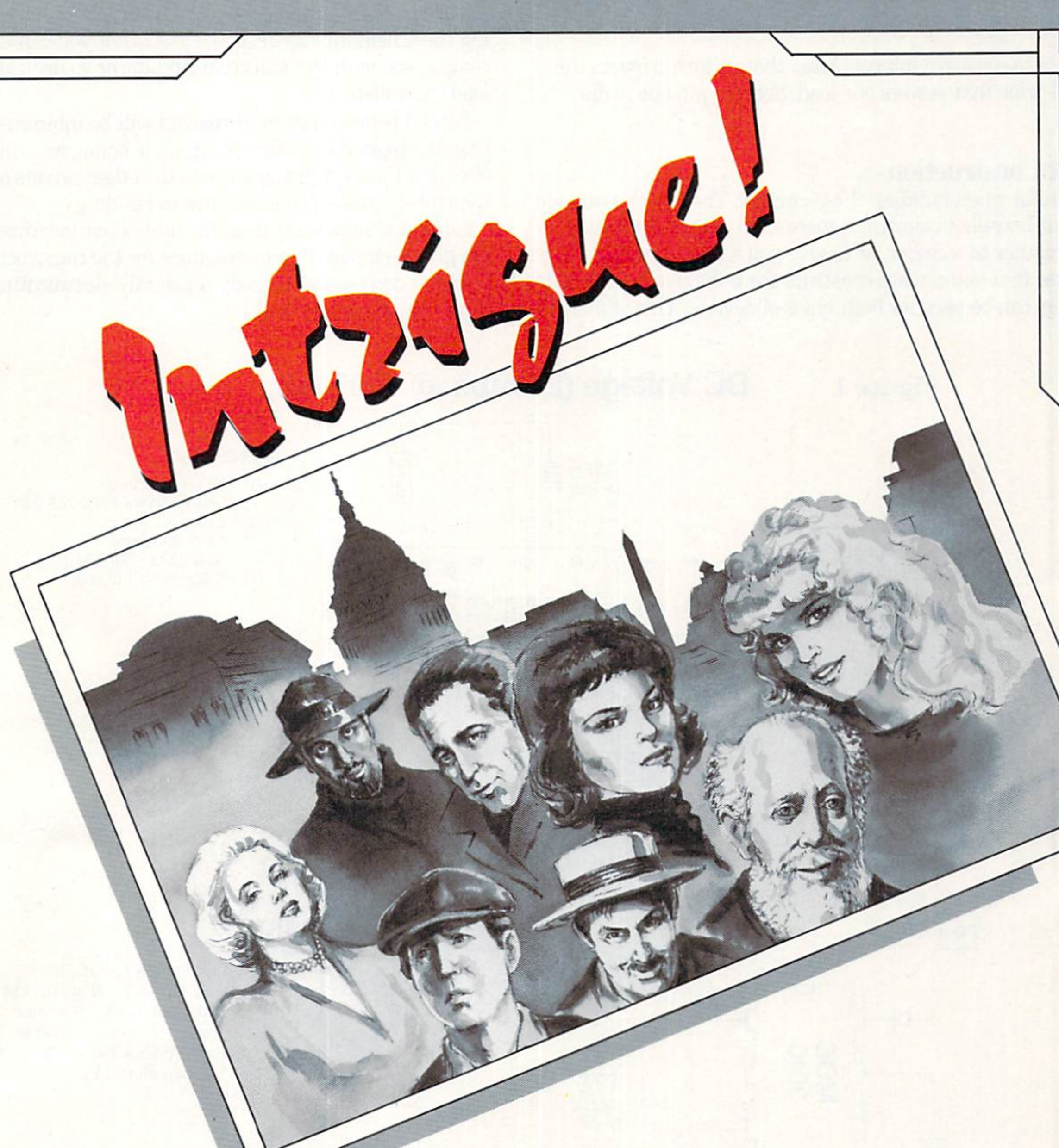
DC Loads

The circuit in Figure 1 can control DC or AC loads up to 120 volts at 2 amps. In this particular circuit we can use a main load that is either resistive or inductive, but notice the diode and capacitor connected across the relay. The relay itself is an inductive load connected directly to our computer. The diode and capacitor are necessary to prevent any damage to the computer. You can, if you wish, use an LED in place of the diode (make sure the polarity of the LED is correct) and see the LED flash every time you turn the circuit off with your computer. This flash represents the voltage pulse being absorbed. The reason you can replace the diode with the LED is that the LED is a diode. LED is an acronym for *L*ight *E*mitting *D*iode.

AC Loads

The circuits in Figures 2 and 3 are exclusively for AC loads; resistive and inductive respectively. The six pin chip, MOC 3010, is an optocoupled triac. This device uses an internal LED to sense when the PB line connected to it is outputting a binary "1" (+5 V). The internal LED trig-

Continued on pg. 48


Intrigue!

Continued from pg. 46

gers a photo-sensitive internal triac that in turn triggers the external triac that powers our load. See the pin out in dia gram 1.

Circuit Construction

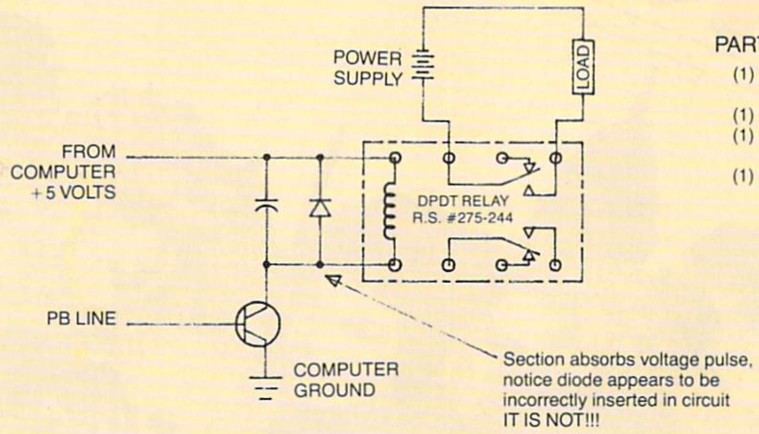
Be careful when building these circuits. The power available from your household electric is more than enough to reduce your computer to a cinder, or to give you a nasty shock.

I advise that you always construct the inductive load circuits, since they can be used for both types of devices. This will alleviate any potential problems in the future. I am however, including the schematics for resistive loads that you can either use for comparison with the inductive circuits, or as dedicated resistive load controllers.

Since I believe that most readers will be interested in controlling AC appliances or devices in their home, we will build the circuit in Figure 3. If you go on to the other circuits on your own, remember to take the same care in building.

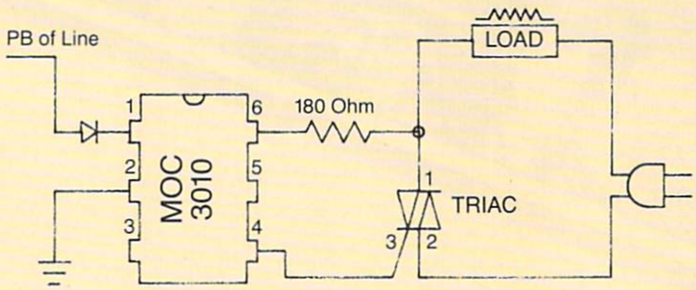
Since it is important that this unit is put together properly, I am giving step-by-step instructions for the construction of this project. I don't want anybody accidently electrocuting themselves, so please be careful.

Figure 1 **DC Voltage (2 amps @ 120 VAC)**



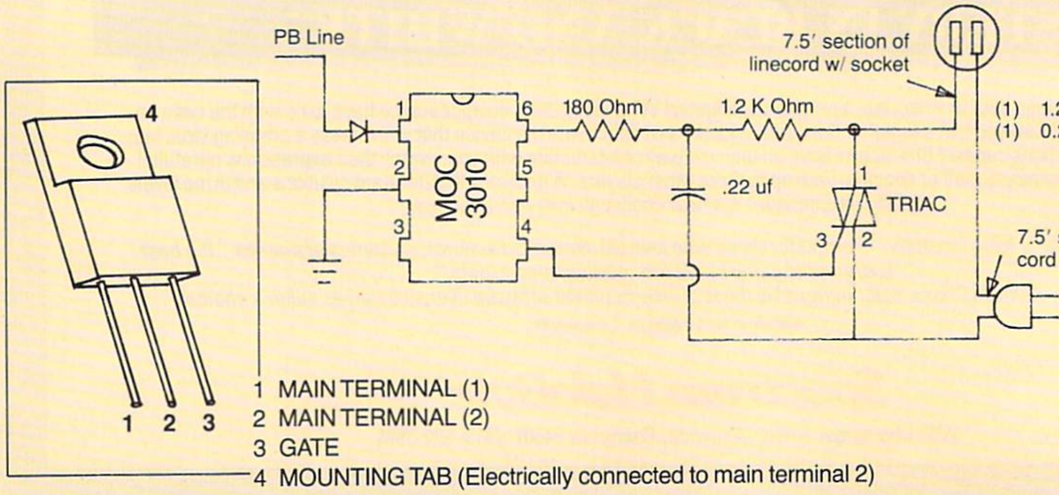
PARTS LIST
- (1) DPDT Dip Relay Radio Shack PN #275-244
- (1) Diode
- (1) NPN Transistor 2N2222 or 2N3904
- (1) Capacitor 0.1 uf disc

Figure 2 **Resistive Load (AC Voltage)**



PARTS LIST
Quantity
- (1) Optocoupler MOC 3010 Radio Shack PN #276-134
- (1) 180 Ohm ¼ watt Resistor
- (1) Triac — 6 Amps — 200 V Radio Shack PN #276-1001
- (1) Subminiature LED

Figure 3 **Inductive Load (AC Voltage)**



Parts Lists
In addition to the above list
- (1) 1.2 K Ohm ¼ watt Resistor
- (1) 0.22 uf disc capacitor

Continued on pg. 50

Continued from pg. 48

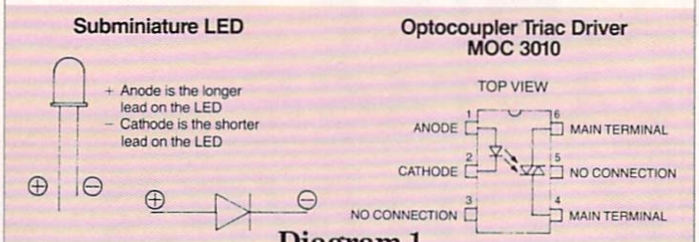


Diagram 1

PARTS LIST	Radio Shack Parts No.(s)	
Push button terminal strip	#274-315	$ .99
2 terminal barrier strips (2/pk)	#274-656	$1.29
6-32 machine screws	#64-3012	$ .99
6-32 hex nuts	#64-3019	$ .99
1.2 K resistor (2/pk)	#271-024	$ .19
180 ohm resistor (2/pk)	#271-014	$ .19
Subminiature red LED (2/pk)	#276-026B	$ .79
Triac 6 amp 200 volts	#276-1001	$1.29
.22 uF cap. (2/pk)	#272-1070	$ .89
15 foot extension cord	#61-2748	$2.39
Experimenters box w/ PC board	#270-284	$3.79
Opto-coupler MOC-3010	#276-134	$1.00

I advise you to use an IC socket when soldering the unit together, so you can plug the MOC chip in after you're finished.

We can not use our prototype breadboard for these projects. The voltages and currents are greater than what can be safely handled on the breadboard. Instead, we will use a small plastic experimenter's box available from Radio Shack. The box comes with a printed circuit board (PCB) that fits nicely inside. All the screws and hardware necessary to secure the PC board into the box and put the box together are also included.

All the components must be soldered to the PC board. We will use a 15 foot extension cord that we cut in half. The plug half of the line cord will bring power from the outlet to our circuit. The socket half of the line cord will lead from the box to the device you wish to power/control. See figure 3.

To begin, drill the holes in the plastic top of the experimenter's box. You will need a hole on each side to accommodate the line cord going in and out. Next, drill four holes on the top surface for the push button terminal strip. Use the terminal strip to mark the holes before drilling. You will have to ream the holes in the terminal strip to accommodate the 6-32 machine screws (see photo). Add one small hole in front of the terminal strip for the LED indicator light.

After you're finished drilling the box, get the PC board and lay out the 2 terminal Barrier Strips as they are in the photo. Mark and drill the holes for the screws.

Assemble the barrier strips to the PC board with machine screws and hex nuts. Assemble the push button terminal strip to the top of the box. Glue the LED indicator light into the hole. Solder a 22 gauge, red wire from the red terminal to the LED. Check the polarity on the LED to make sure you solder the wire to the proper (anode) LED terminal. Then solder another red wire from the opposite side of the LED. Solder 22 gauge black wire to the black terminal. Make the leads off the LED and black terminal about 6-7" long so that you will have sufficient wire to make the final assembly easy.

In the photo you can see that I used a 16 pin IC socket for the MOC-3010. I only used that socket because I had it lying around. An 8 pin socket would be fine. I advise you to use an IC socket when soldering the unit together, so you can plug the MOC chip in after you're finished. This will prevent you from overheating the IC with your soldering iron.

Lay out your parts on the PC board and begin soldering them point to point. Look at the picture diagram of the triac — the face up picture is how the triac looks straight-on. Notice the lead numbers at the bottom, and compare them to the lead numbers on the schematic. Take extra care that you connect these leads properly.

Attach the line cords to the barrier strips. Notice that the wires that are carrying the main load current to and from the triac are heavier gauge wire than we usually use. Use 16 or 18 gauge wire for these connections.

Solder the red wire from the LED to pin 1 of the opto-coupler and the black wire from the terminal to pin 2. Recheck all of your wiring at this point. Make sure you don't have any accidental solder bridges. If you are satisfied, mount the PC board in the box and put on the bottom plate. Make sure none of your wiring on the bottom is touching the bottom plate. If it is, correct it.

Test

Attach the PB0 line to the red push-button terminal and a ground wire from the computer to the black terminal. Plug the line cord into your home electric socket and the device you want to power into the other end of the extension. Turn on the computer.

C-64 and 128		Vic - 20
Poke 56579, 255	DDR set up	Poke 37138, 255
Poke 56577, 1	turn device on	Poke 37136, 1
Poke 56577, 0	turn device off	Poke 37136, 0

These pokes should turn the device that is plugged in on and off. If it doesn't, you have a wiring error and should disconnect the plug from your home socket. Now, open the box to find the error.

The triac is rated 200 volts at 6 amps, which means that it is capable of handling 1200 watts. In order to pass that much current, heat sinks (which we haven't put in) would be required. I advise you to keep the maximum power under 500 watts.

Program

Now we shall incorporate the toxic gas sensor from Part three. My reason for doing this is two fold. First, as an exercise in computer control and second, as an exercise in logic instructions. It is essential that we use logic instructions in the program so that we can read and react through the user port, while maintaining or changing the status of individual bits. If we fail to do this, we could lose the integrity of our sensor readings and we would be constantly stopping and starting the power to the device.

So for all you people who glossed over the logic instructions in part one, it's time to break it out and read it over.

Construct the toxic gas sensor as described in part three. Attach PB-2 to the red terminal on our electric control box and a ground wire to the black terminal. Now type in the program at

the end of the article.

Plug an electric fan into the control box. This will be our main load. When the sensor detects gas it will automatically turn on the fan, and keep the fan on until the gas concentration returns to a safe level.

For the doubting Thomas' out there, who question the validity and necessity of the logic instructions, enter the programs as they orignally appeared in the magazine. Add the two program lines for decision making (If/Then) and see for yourself how inadequate simple poke commands are for operating the device.

Smart Control

In most cases this article would have finished with the last paragraph. I would like to make one more point on basic computer control circuits. To make this point I wish to draw an analogy.

Let's say that you've just returned from your local newspaper stand with the latest edition of *Commodore Magazine.* You sit in your favorite easy chair, reach over to turn on the lamp to read by, and behold — no light. Darn, you say to yourself. You look down to the socket, check to make sure the lamp is plugged in. It is. You look over to the clock on the wall that's on the same fuse as the lamp. The clock is ticking away, so you know you have juice going to the lamp. You flick the lamp switch a couple of times to make sure the switch isn't stuck. Now, you take the lampshade off the lamp, and sure enough that black spot on the bulb lets you know that it's burned out. You replace the bulb, the lamp works fine, and you finally get to read the magazine you justly deserve.

What just happened in this incident? To you, it's nothing but standard procedure, but it is a good example of a smart control. The person knew that the light wasn't lit after turning on the lamp. He then went through various steps to locate and correct the problem. But what about the computer? Had it been the computer's job to turn on the lamp, would it have known whether the light was on? Probably not. To build a smart control we must give the computer some procedure or device (feedback) to check if the action it took was successful. For the light example we might use a photocell or a photoresistor for a feedback signal. If the feedback gave a negative response, the computer could, if we want, go through testing and corrective procedures to find and possibly correct the fault. Naturally we wouldn't go through the time, trouble or expense for a simple light. But in other circumstances, such as with robotics, security systems, nuclear reactor controls, or in-flight navigation systems, you would. You would want feedback and redundancy built into every system.

Keep this information in mind, so if you someday find that you have a need for a smart controller, you can get your computer to handle it. C

Control Program 64

```
5 POKE 56579,255
7 POKE 56577,Ø
1Ø POKE 56579,127
12 FOR X=Ø TO 7
14 POKE 56577,PEEK(56577)AND 252
   :POKE 56577,PEEK(56577)OR 1
15 NEXT X
2Ø IF(PEEK(56589)AND 8)=Ø THEN 2Ø
3Ø X=PEEK(56588)
4Ø PRINT X;
42 IF X>5Ø THEN POKE 56577,
   PEEK(56577)OR 4
43 IF X<5Ø THEN POKE 56577,
   PEEK(56577)AND 251
45 POKE 56577,PEEK(56577)OR 2
5Ø GOTO 12
```

END

Control Program VIC-20

```
1Ø POKE 37138,255
2Ø POKE 3715Ø,127:REM INTERRUPT FLAG
   ENABLE
3Ø POKE 37147,12:REM AUXILIARY
   CONTROL REGISTER
35 POKE 37136,2
4Ø FOR X=Ø TO 7
5Ø POKE 37136,PEEK(37136)AND 252
   :POKE 37136,PEEK(37136)OR 1
6Ø NEXT X
7Ø X=(PEEK(37149)AND 4)
   :REM SERIAL FLAG
8Ø X=PEEK(37146)
9Ø PRINT X;
92 IF X>5Ø THEN POKE 37136,
   PEEK(37136)OR 4
94 IF X<5Ø THEN POKE 37136,
   PEEK(37136)AND 251
95 POKE 37136,PEEK(37136)OR 2
1ØØ GOTO 4Ø
```

END


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by Scott Reid

Seq-Edit

For the Commodore 64



LINDA CLARK

As its name implies, Seq-Edit is a utility program for editing SEQ, or sequential, disk files. Although most word-processing programs for the 64 allow you to edit sequential files, Seq-Edit has one important feature that most word-processors lack: it has an 80 column screen. Since the 64's screen is only 40 columns wide, you can only see 40 of the 80 columns at one time. Seq-Edit's text buffer is 80 columns wide by 581 rows long. The computer's screen is a 40 column by 22 row "window" into the buffer. (Three lines at the bottom of the screen are used for prompts.) As you type and move the cursor around, the window moves to show the portion of the buffer that you are editing.

Seq-Edit was originally written for working with text files that had been downloaded from various bulletin boards. Most all of these files are in 80 column format, and, as you may well know, reading 80 column documents (especially charts and tables) that are split into 40 column chunks can be very frustrating. Seq-Edit is also useful for editing sequential data files. The only sequential files that Seq-Edit can not edit are those with single data strings larger than 80 characters and those with more than 581 rows of text (about 45,000 characters.) In addition to editing, Seq-Edit can also be used for combining several files into one, splitting a large file into several smaller ones, and printing files.

Getting Started

Seq-Edit is written in about 3Kb of machine language, starting at location \$C000 (49152). Because it uses the locations from \$0800 to \$C000 for the text buffer, it will erase any BASIC program in memory whenever you run it. So BE CAREFUL!

Type in the BASIC loader program using the Magazine Entry Program. Hexadecimal numbers without commas were used in the data statements to reduce typing time. After you have typed in the loader program, save a copy to disk, with a filename of "SEQEDIT.LDR". Now put in a disk on which you would like the Seq-Edit program itself saved, and run the loader program. It will first ask you for a filename for the object program. Press RETURN for the default filename of "SEQEDIT". After about three and a half minutes, there will be a copy of Seq-Edit both in memory and on the disk. To load the disk copy from now on, type LOAD "SEQEDIT",8,1.

> Now you can edit, print and split any text files on your disks.

Using the Program

Once Seq-Edit is in memory, type SYS 49152 to start it. You will see an empty window with your cursor in the top left-hand corner at position 1,1. The column and line position of your cursor in the buffer are indicated in the bottom line of the screen. The editor is now ready to accept keyboard input, including the various commands described below. Most of the keys used by the standard Commodore screen editor have the same function in Seq-Edit, so it shouldn't take you long to get used to it.

Following is a list of the functions of each key that Seq-Edit uses:

Character keys, shifted and unshifted: place the character pressed at the cursor position and move the cursor one space to the right. If the cursor is in column 80, it is moved to column one of the next line.

RETURN: move the cursor to column one of the next line.

Cursor keys: move the cursor up, down, left or right. If the cursor is at the edge of the window, the window is moved to show the cursor position plus ten characters to its left or right.

DELete: delete the character to the left of the cursor and move all characters on the current line, under and to the right of the cursor, left by one position.

INST: insert a blank space under the cursor and move all characters on the current line, under and to the right of the cursor, right by one position.

F2 (Column-80): move the cursor to column 80 of the current line.

F5 (Page Up): Scrolls the entire window up 22 lines.

F7 (Page Down): Scrolls the entire window down 22 lines.

HOME: move the cursor to column one of the first line of the current window. If the cursor is already in this position (i.e., if you press HOME twice in succession), the cursor will move to column one, line one of the buffer.

CLR (Shift-HOME): erase entire buffer and move cursor column one, line one. Just like SYS 49152.

CTRL-Y (Delete Line): erases the entire current cursor line, regardless of the cursor column. All lines below the cursor are moved up one line. Note that this command along with CTRL-N may take a few seconds if you are near the top of the buffer.

CTRL-N (Insert line): inserts a blank line under the cursor, regardless of the cursor column. All lines under and below the cursor are moved down one line. If there is any data in line 581, it is lost.

CTRL-W (Zap line): fills the current cursor line with spaces. Unlike CTRL-Y, this does not move the lines under the cursor line up.

RUN/STOP (Tab): moves the cursor to the next column or tab stop. When you press Tab, Seq-Edit looks at the line directly above the cursor line for the beginning of a new word (a character preceded by a space) to the right of the current cursor position. If a new word is found, the cursor is moved directly under the first character of the word. If no new word is found, the cursor is positioned at the next tab stop. The tab

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stops are pre-set at every four columns.

F1 (Load): load a sequential file from disk into the buffer. When prompted, enter the filename, or press RETURN to abort LOAD. The file will be loaded starting at the current cursor position, and the characters will be read just as if they were being typed from the keyboard. If the filename you requested is not found, a capital 'G' will be printed and the drive light will flash.

F3 (Save): save a portion of the buffer to the disk as a sequential file. First enter the filename or press RETURN to abort SAVE. You will then be prompted to move the cursor to the first line to save. Use the cursor keys, F5, and F7 and press RETURN. Do the same for the last line to be saved.

CTRL-H (Help): displays a brief list of single key commands on the screen. Press any key to return to editing mode.

CTRL-X (Exit): leave the editor and return to BASIC. Be careful with this key, as all data is lost when you use it.

CTRL-P (Print): print a portion of the buffer to a serial device. This command functions similar to F3-Save. But instead of entering a filename, you are prompted for a device number and a secondary address. At the DEV: prompt, press '4', '6', or RETURN to abort. Most printers use device four, but the Commodore 1520 Printer/Plotter uses device number six. At the SEC: prompt, press a number from 1 to 9, or RETURN for no secondary address. For Commodore 1525 and compatible printers, the secondary address will usually be seven. After entering the device number and secondary address, select the first and last line to be printed just as you did for F3-Save. ■

Before typing this program, read "How to Enter Programs" and "How to Use the Magazine Entry Program." The BASIC programs in this magazine are available on disk from Loadstar, P.O. Box 30007, Shreveport, LA 71130-0007, 1-800-831-2694.

Seq-Edit Loader

```
10 PRINT"[CLEAR]INSERT DISK FOR
    OBJECT CODE"'BAYF
20 PRINT"ENTER FILENAME[SPACE3]
    SEQEDIT[LEFT9]";:INPUT F$'CELL
30 PRINT"[DOWN2]CREATING
    "+F$+"..."'DCWE
40 LO=49152:OPEN 1,8,8,F$+",P,W"
    :PRINT#1,CHR$(0)+CHR$(192);'HDSL
50 READ A$'BCKB
60 IF LEN(A$)<>28 THEN CLOSE 1
    :PRINT"ERROR. LINE"1000+INT(
    (LO-49152)/14):END'MBAS
70 FOR R=0 TO 13:T$=MID$(A$,R*2+1,2)
    :TL$=RIGHT$(T$,1):TH$=LEFT$(T$,
    1)'LMKS
80 IF T$="XX"THEN PRINT"DONE.":CLOSE 1
    :END'GFVK
90 TL=VAL(TL$):IF TL$>="A"THEN
    TL=ASC(TL$)-55'JUQQ
100 TH=VAL(TH$):IF TH$>="A"THEN
     TH=ASC(TH$)-55'JUVG
110 IF TL>15 OR TH>15 THEN CLOSE 1
     :PRINT"ERROR. LINE"1000+INT(
     (LO-49152)/14):END'MDKM
120 POKE LO,TL+TH*16:LO=LO+1
     :PRINT#1,CHR$(TL+TH*16);:NEXT R
     :GOTO 50'LHFM
1000 DATA A9008D20D08D21D0A9FF8D8A022
      0'BDRY
1001 DATA 13C04CEEC1A99320D2FFA90E20D
      2'BDXA
1002 DATA FFA90520D2FFA216A0001820F0F
      F'BDBB
1003 DATA 207FC0A000B999C0C900F00720D
      2'BDAC
1004 DATA FFC84C2FC0A9008D84038D85038
      D'BDQD
1005 DATA 86038D87038D880385B28D89038
      5'BDRE
1006 DATA 2D852FA9048530A90885B3852EA
      9'BDXF
1007 DATA 0085FEA90885FFA000A92091FEC
      8'BDKG
1008 DATA D0F9E6FFA5FFC9C0D0F1A936850
      1'BDKI
1009 DATA 60A90085FEA9D885FFA000A90C9
      1'BDJI
1010 DATA FEC8D0F9E6FFA5FFC9DCD0F1600
      5'BDLB
1011 DATA 60606060606060606060606060606
      0'BDXB
1012 DATA 60606060606060606060606060606
      0'BDXC
1013 DATA 6060606060606060606060600DCC4
      9'BDAD
1014 DATA 4E453A202020202020C34F4C554
      D'BDJE
1015 DATA 4E3A2020202020209EC34F4D4D4
      F'BDWF
1016 DATA 444F5245203634119D9D9D9D9D9
      D'BDHG
1017 DATA 9D9D9DD3C5D12DC5C4C9D4130
      0'BDWH
1018 DATA A900850285FCA90485FD18A5B26
      D'BDUI
1019 DATA 890385FEA5B3690085FFA000B1F
      E'BDIJ
1020 DATA 91FCC8C028D0F718A5FE695085F
      E'BDTB
1021 DATA A5FF690085FFA5FC18692885FCA
      5'BDYC
1022 DATA FD690085FDE602A502C916D0D36
      0'BDMD
1023 DATA 0000400E6FED002E6FFA9008D4
      4'BDRE
1024 DATA C18D45C1A2101826FE26FF2E44C
      1'BDXF
1025 DATA 2E45C138AD44C1E90AA8AD45C1E
      9'BDJG
1026 DATA 0090068C44C18D45C1CAD0DF26F
      E'BDOH
1027 DATA 26FFAD44C1186930209AC1A5FE0
      5'BDAI
1028 DATA FFD0C1A99D20D2FFA92020D2FF2
      0'BDSJ
1029 DATA D2FF606020D2FFA99D20D2FF20D
      2'BDGK
1030 DATA FF6060A015A2171820F0FFAD840
      3'BDXC
1031 DATA 85FEA90085FFA90520D2FF2046C
      1'BDID
1032 DATA 60A009A2171820F0FFAD850385F
      E'BDIE
1033 DATA AD860385FFA90520D2FF2046C16
      0'BDLF
```

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```
1034 DATA A000B12F0980912F60A000B12F2
     9'BDBG
1035 DATA 7F912F6020FCC020A7C120C1C12
     0'BDJH
1036 DATA DCC120E4FFC900F0F98502A000B
     9'BDII
1037 DATA 23C2C502F00AC8C015D0F4A5024
     C'BDYJ
1038 DATA 7AC4B938C285FEB94DC285FF6CF
     E'BDQL
1039 DATA 00868788030D111D9D91190E131
     4'BDIL
1040 DATA 94931785891018083AC111C0497
     C'BDGD
1041 DATA EE35D8A94B68936162CB52D0D1E
     7'BDSE
1042 DATA 77C4C4C5C5C4C3C2C3C3C6C6C2C
     5'BDBF
1043 DATA C5C2C2C7C7C9C2CA2013C04CEEC
     1'BDBG
1044 DATA A52DC5B2D02AA52EC5B3D024A90
     0'BDHH
1045 DATA 8D84038D85038D87038D880385B
     2'BDBI
1046 DATA 852D852F8D8903A90885B3852EA
     9'BDNJ
1047 DATA 0485304CEEC138AD8503ED88038
     D'BDUK
1048 DATA 8503AD8603E9008D8603A9008D8
     4'BDYL
1049 DATA 038D87038D88038D8903A5B2852
     D'BDJM
1050 DATA A5B3852EA900852FA90485304CE
     E'BDQE
1051 DATA C138A52DED840385FEA52EE9008
     5'BDNF
1052 DATA FFA000A92091FEC8C050D0F94CE
     E'BDWG
1053 DATA C1A93785016C00A020F4C24CEEC
     1'BDJH
1054 DATA 20E5C1AD8403C94FD004204FC46
     0'BDXI
1055 DATA EE840318A52D6901852DA52E690
     0'BDJJ
1056 DATA 852EAD8703C91E900BAD8403C94
     7'BDWK
1057 DATA B004EE890360EE870318A52F690
     1'BDJL
1058 DATA 852FA5306900853060 20E5C1AD8
     4'BDJM
1059 DATA 03C900D00620DCC14CFAC1CE840
     3'BDSN
1060 DATA 38A52DE901852DA52EE900852EA
     D'BDHF
1061 DATA 8703C909B00DAD8403C9089006C
     E'BDYG
1062 DATA 89034CEEC1CE870338A52FE9018
     5'BDCH
1063 DATA 2FA530E90085304CEEC12082C34
     C'BDAI
1064 DATA EEC1AD8503C944D00BAD8603C90
     2'BDLJ
1065 DATA D00420DCC16018AD850369018D8
     5'BDXK
1066 DATA 03AD860369008D860318A52D695
     0'BDDL
1067 DATA 852DA52E6900852EAD8803C915D
     0'BDEM
1068 DATA 0E18A5B2695085B2A5B3690085B
     3'BDFN
1069 DATA 60EE880318A52F692885 2FA5306
     9'BDMO
1070 DATA 0085306020DEC34CEEC1AD8503C
     9'BDQG
1071 DATA 00D00BAD8603C900D00420DCC16
     0'BDYH
1072 DATA 38AD8503E9018D8503AD8603E90
     0'BDLI
1073 DATA 8D860338A52DE950852DA52EE90
     0'BDIJ
1074 DATA 852EAD8803C900D00E38A5B2E95
     0'BDMK
1075 DATA 85B2A5B3E90085B360CE880338A
     5'BDBL
1076 DATA 2FE928852FA530E900853060AD8
     4'BDPM
1077 DATA 03C94FF00B20F4C2A296CAD0FD4
     C'BDON
1078 DATA 34C44CEEC1204FC44CEEC138A52
     F'BDVO
1079 DATA ED8703852FA530E900853038A52
     D'BDKP
1080 DATA ED8403852DA52EE900852EA9008
     D'BDTH
1081 DATA 84038D87038D89032082C360208
     1'BDXI
1082 DATA C44CEEC160C92090FBC940B007A
     0'BDFJ
1083 DATA 00912D4CBBC4C961B00A38E940A
     0'BDJK
1084 DATA 00912D4CBBC4C9A190DEC9C0B00
     A'BDFL
1085 DATA 38E940A000912D4CBBC4C9DBB0C
     C'BDLM
1086 DATA 38E980A000912D20F4C24C80C42
     0'BDQN
1087 DATA C7C44CEEC1A9008540A5B2C900D
     0'BDFO
1088 DATA 09A5B3C908D0034C10C538AD850
     3'BDLP
1089 DATA E9018D8503AD8603E9008D86033
     8'BDDQ
1090 DATA A5B2E95085B2A5B3E90085B338A
     5'BDNI
1091 DATA 2DE950852DA52EE900852E20FCC
     0'BDDJ
1092 DATA E640A540C916D0BB602017C54CE
     E'BDQK
1093 DATA C1A9008540A5B2C9B0D009A5B3C
     9'BDOL
1094 DATA B6D0034C60C518AD850369018D8
     5'BDHM
1095 DATA 03AD860369008D860318A5B2695
     0'BDBN
1096 DATA 85B2A5B3690085B318A52D69508
     5'BDYO
1097 DATA 2DA52E6900852E20FCC0E640A54
     0'BDAP
```

Continued on pg. 60

Continued from pg. 58

```
1098 DATA C916D0BB60AD8403C94FD0034CE
     E'BDEQ
1099 DATA C138A52DED840385FEA52EE9008
     5'BDNR
1100 DATA FFA04EB1FEC891FE88CC8403F00
     4'BDGB
1101 DATA 884C7BC5A920A000912D4CEEC13
     8'BDYB
1102 DATA A52DED840385FEA52EE90085FFA
     C'BDHD
1103 DATA 840388C0FFD0034CEEC1C8B1FE8
     8'BDUD
1104 DATA 91FEC8C050D0F5A04FA92091FE4
     C'BDLE
1105 DATA 35C3AC8403C04FD0034CEEC1C88
     4'BDLF
1106 DATA 02AD8503C900D01DAD8603C900D
     0'BDOG
1107 DATA 1620F4C2AD8403C950F0092903C
     9'BDCH
1108 DATA 03F0034CDBC54CEEC138A52DE94
     F'BDWI
1109 DATA 85FEA52EE90085FFA000B1FEC92
     0'BDKJ
1110 DATA F018E60218A5FE690185FEA5FF6
     9'BDAB
1111 DATA 0085FFA502C950D0E34CDBC5A00
     0'BDXC
1112 DATA B1FEC920D018E60218A5FE69018
     5'BDQD
1113 DATA FEA5FF690085FFA502C950D0E34
     C'BDSE
1114 DATA DBC520F4C2AD8403C502D0F64CE
     E'BDPF
1115 DATA C120E5C1A94085FCA9BD85FDA99
     0'BDTG
1116 DATA 85FEA9BD85FF38A52DED8403856
     0'BDUH
1117 DATA A52EE9008561A000B1FC91FEA5F
     C'BDBI
1118 DATA C560D014A5FDC561D00EA000A92
     0'BDYJ
1119 DATA 9160C8C050D0F74CEEC138A5FCE
     9'BDSK
1120 DATA 0185FCA5FDE90085FD38A5FEE90
     1'BDYC
1121 DATA 85FEA5FFE90085FF4C6CC620E5C
     1'BDNE
1122 DATA 38A52DED840385FCA52EE90085F
     D'BDIE
1123 DATA 18A5FC695085FEA5FD690085FFA
     0'BDOF
1124 DATA 00B1FE91FCA5FEC900D015A5FFC
     9'BDJH
1125 DATA BFD00FA000A9209940BDC8C050D
     0'BDVH
1126 DATA F64CEEC1E6FCD002E6FDE6FED00
     2'BDVJ
1127 DATA E6FF4CC7C670A000A920990004C
     8'BDJJ
1128 DATA C0C8D0F6A91320D2FFA99820D2F
     F'BDQK
1129 DATA A9C620D2FFA94920D2FFA94C20D
     2'BDML
1130 DATA FFA94520D2FFA94E20D2FFA9412
     0'BDMD
1131 DATA D2FFA94D20D2FFA94520D2FFA93
     A'BDQF
1132 DATA 20D2FFA00020CFFFC90DF007C89
     9'BDHF
1133 DATA 72CF4C3DC78CF7C620FCC06020F
     8'BDQG
1134 DATA C6ADF7C6C900D0034CEEC1ACF7C
     6'BDZI
1135 DATA A92C9973CFC8A9539973CFC8A92
     C'BDDJ
1136 DATA 9973CFC8A9529973CFC898A0CFA
     2'BDCK
1137 DATA 7320BDFFA901A208A00020BAFF2
     0'BDLK
1138 DATA C0FF20DCC1A20120C6FF20CFFF8
     5'BDDL
1139 DATA 0220B7FF48A50220C5C72081C42
     0'BDKM
1140 DATA FCC020A7C120C1C120DCC16829F
     C'BDNE
1141 DATA C900F0DCA90120C3FF20E7FF4CE
     E'BDGG
1142 DATA C1C90DF00160204FC4A9006020F
     8'BDAG
1143 DATA C6ADF7C6C900D0034CEEC12044C
     8'BDCH
1144 DATA 4C99C820FCC020C1C120A7C120D
     C'BDWI
1145 DATA C120E4FFC90DF028C911D006208
     2'BDCJ
1146 DATA C34CE3C7C991D00620DEC34CE3C
     7'BDKK
1147 DATA C987D00620C7C44CE3C7C988D0D
     7'BDWL
1148 DATA 2017C54CE3C738A52DED840385F
     E'BDMM
1149 DATA A52EE90085FF18A000A21620F0F
     F'BDPN
1150 DATA A90520D2FFA027A96020D2FF88D
     0'BDYF
1151 DATA F86018A216A00020F0FFA90520D
     2'BDYG
1152 DATA FFA000B986C9C900F00720D2FFC
     8'BDUH
1153 DATA 4C53C820E3C7A5FE8DE803A5FF8
     D'BDMJ
1154 DATA E90318A216A00020F0FFA90520D
     2'BDVJ
1155 DATA FFA000B9ACC9C900F00720D2FFC
     8'BDRK
1156 DATA 4C7DC820E3C7A5FE8DEA03A5FF8
     D'BDOM
1157 DATA EB0360A90FA208A00F20BAFFACF
     7'BDVM
1158 DATA C6C8C898A271A0CF20BDFFA9538
     D'BDKO
1159 DATA 71CFA93A8D72CF20C0FFA90F20C
     3'BDXO
1160 DATA FFACF7C6A92C9973CFC8A953997
     3'BDWH
1161 DATA CFC8A92C9973CFC8A9579973CFC
     8'BDCI
```

```
1162 DATA 98A273A0CF20BDFFA901A208A00
     1'BDXI
1163 DATA 20BAFF20C0FFA20120C9FF2028C
     9'BDSJ
1164 DATA A90120C3FF20E7FF4CEEC1C920B
     0'BDPK
1165 DATA 0718694020D2FF60C940B00420D
     2'BDAL
1166 DATA FF60C960B00718698020D2FF601
     8'BDMM
1167 DATA 694020D2FF60ADEA03CDE803ADE
     B'BDBO
1168 DATA 03EDE903B00160ADE80385FEADE
     9'BDHO
1169 DATA 0385FFA04FB1FEC920D00D88C0F
     F'BDCP
1170 DATA D0F5A90D20D2FF4C67C98402A00
     0'BDTH
1171 DATA B1FE2003C9C402F0EBC84C5AC9A
     5'BDQI
1172 DATA FECDEA03D008A5FFCDEB03D0016
     0'BDIK
1173 DATA 18A5FE695085FEA5FF690085FF4
     C'BDYK
1174 DATA 41C912D343524F4C4C20544F204
     6'BDHL
1175 DATA 49525354204C494E452C2050524
     5'BDQM
1176 DATA 53532052455455524E2E920012D
     3'BDIN
1177 DATA 43524F4C4C20544F204C4153542
     0'BDKO
1178 DATA 4C494E452C2050524553532052 4
     5'BDLP
1179 DATA 5455524E2E9200A000A92099000
     4'BDPQ
1180 DATA C8C0C8D0F6A99820D2FFA91320D
     2'BDYI
1181 DATA FFA9C420D2FFA94520D2FFA9562
     0'BDQJ
1182 DATA D2FFA93A20D2FF20E4FFC900F0F
     9'BDPL
1183 DATA C934F00BC936F007C937F0034CE
     E'BDHL
1184 DATA C120D2FF38E9308DED03A90D20D
     2'BDMM
1185 DATA FFA9D320D2FFA9C120D2FFA93A2
     0'BDGO
1186 DATA D2FF20E4FFC900F0F9C9309010C
     9'BDAO
1187 DATA 3AB00C20D2FF38E9308DEE034C4
     E'BDDP
1188 DATA CAA9FF8DEE032044C8A901AEED0
     3'BDIR
1189 DATA ACEE0320BAFFA90020BDFF20C0F
     F'BDUS
1190 DATA A20120C9FF2028C9A90120C3FF2
     0'BDTJ
1191 DATA E7FF4CEEC1A000B991CAC900F00
     7'BDRK
1192 DATA 20D2FFC84C79CA20E4FFC900F0F
     9'BDFM
1193 DATA 4CEEC113980D0D2A2A2A2A2A2A2
     A'BDRM
1194 DATA 2A2A2A2A2A0D2A2020202020202
     0'BDLN
1195 DATA 2020202A0D2A204631202D4C4F4
     1'BDVO
1196 DATA 44202A0D2A204632202D5341564
     5'BDFP
1197 DATA 202A0D2A204633202D432038302
     0'BDPQ
1198 DATA 2A0D2A204635202D50475550202
     A'BDRR
1199 DATA 0D2A204637202D5047444E202A0
     D'BDNS
1200 DATA 2A20522F532D5441422020202A0D2
     A'BDCB
1201 DATA 205E59202D44454C4C202A0D2A2
     0'BDEC
1202 DATA 5E4E202D494E534C202A0D2A205
     E'BDUD
1203 DATA 57202D5A41504C202A0D2A205E5
     0'BDWE
1204 DATA 202D50524E54202A0D2A205E582
     0'BDLF
1205 DATA 2D45584954202A0D2A205E48202
     D'BDDG
1206 DATA 48454C50202A0D2A20202020202
     0'BDJH
1207 DATA 202020202A0D2A2A2A2A2A2A2A2
     A'BDMI
1208 DATA 2A2A2A2A0D00FFFF0000FFFF00X
     X'BDJK
```

END

by Elizabeth Deal

Matches

An exercise in planning a small piece of code

Teachers often need to develop small tests in a hurry. One clever teacher once wondered aloud if she could have some kind of an easy, general way of developing tests which are similar in nature. Why not, I said, let's try it. A bit later we had a bare-bones prototype program. It can be used to test word-matching (as in "which words go together?") but need not be limited to this kind of application. The program is now a template, a pattern for developing similar tests. It will run on all CBM computers. It is also well suited for conversion to the Plus/4 and C128 computer's loop structures WHILE-WEND or DO-UNTIL as everything is coded in form of loops and subroutines.

Currently, the program throws some data on the screen, poses questions and checks the answers. The program applies to ANY test which can be similarly constructed. It could contain answers to small math problems, it could contain lists of synonyms, or lists of opposites (if the question is changed to say the opposite!) and so on. The point of this exercise is to save teachers' time. If a task can be handled by one program, why write fifty?

To use the program for your own application, observe how the program behaves using the sample data and then substitute real data. The teacher can shorten the list, and/or add titles, do more input-checking (very important), permit three tries, perhaps, etc.

Lines 120-170

The variables at the beginning of the program should be set up to match your application. N = how many pairs of word-answer data items there are. Currently it is 20. Z$ is a string of zeros which is used to make HT$, a string which holds zeros or x's to flag whether an item has or hasn't already been used. B$ is a string of spaces to clear screen lines containing a question, an answer, or the computer's reaction. The strings D$, cursor down, and U$, cursor up, position the cursor to print. MS$() is a tiny array of two possible computer reactions to what the user says.

Lines 180-220

Lines 180-200 make room for and read



JIM OWENS

in, from data lines, a list of words, W$(), numbered from 1 to N. They then read in a list of corresponding correct answers, A$(). Array CA() will hold a cross-reference of answer numbers, developed randomly. The correct answer for word #2 is answer#2 in data lines, but, when randomly presented on the screen, the test will place the answer in some other location.

Lines 210 and 220 clear the screen and set up HT$ to be N zeros. Why here? To allow for flexibility in reading. Later, you may change this program to do the data counting for you. In this case, you'll be modifying N. Once all the things have been read in, you're sure that N is valid, so now we're safe.

Lines 240-340

Here comes the tricky part. We have to arrange correct answers in random order, but we can't scramble it so badly that cats would chirp. We have already read in pairs of words and their correct answers, now we have to match a line (counter KT) to the correct answer by building an array CA(). The index of that array is RN, a random number.

A subroutine in line 550 will deliver a random number. We have one more problem: once an item has been taken, we cannot repeat it. So every time we take a number, we put an x where a zero was in the "hit-string" HT$. As the program runs, especially if N is substantially larger than 20, you'll see the computer slowing down a bit as it struggles with duplicates. In any case, if the first random number is 4, then HT$ will be 000x00 ... etc. This process is repeated N times (counted in KT), and we can then immediately print the first, original word (line 270) with the answer number, and a random answer (line 280).

In line 270 the columns get separated by tabbing (two commas). If it doesn't fit on your screen, change to 1 comma or reformat the output altogether using string manipulation of W$() and B$. If you plan to output such lists to a printer, tabbing is unlikely to work neatly.

Time for a test. We now need to position the cursor under the 20 items (of course you can place it wherever you please by playing with the D$ and U$ controls), so that a question can be posed there. Once again, we could avoid duplicates by setting HT$ to zeros and filling it with X's as the numbers are being used, but it isn't currently coded in.

Lines 350-490

The test is repeated as many as N times. The subroutine in line 550 delivers a random number which then becomes an index, W, which prints a correct word. Duplicates aren't checked, but you can repeat the code from line 290 if you wish. Better yet, create a subroutine which line 290 will call, so that we can also call it from line 370. I'll leave this to you as an exercise.

The user answers by typing in a number. The INPUT statement in line 400 accepts anything. During the test, you can quit by pressing RETURN (IF statement in line 400). You could elaborate on this code to make it better. For example, set up a subroutine to check what the user types, and call it from line 400. If you don't like what the user is doing, keep inputting. This could get tricky. What will you do if the screen scrolls? Can you permit scrolling? How about clearing the screen? ... There really are many things to take care of, but you can think about them as separate problems to solve with separate pieces of code; just as we have done with the random number maker.

If the user types a correct answer, we will add 1 to the number of right answers, C and set a flag FC to 1. This allows us to do two things. One, we print the computer response numbered either zero or one (see MS$() in lines 160-170). And two, it permits us to print additional information if the user typed a wrong answer (line 450, CA(W) is the correct answer), when FC remained zero. All messages end with a semicolon to hold the cursor on the same line. However, when we're finished, we can finish the line by coding PRINT (line 460).

All items are finished. Show the final "score" and quit the program. Again, you may do anything here that suits the application.

Lines 510-580 - Subroutines

These are "separable" tasks. They could have been coded above, but it would require coding the same thing several times. So it's neater to stick the repetitive code into a subroutine you can call when you need. The first one formats a number V to two places. In the main program V was always count KT, but you may need it for something else. Just set V and call 520. Plus/4 and C128 users can code a PRINT USING"##";v statement here instead of the string manipulations. The second subroutine returns a unique random number RN. It sits in a loop checking HT$ for X's until it finds a random number that has no correspondence in HT$.

Lines 600-630 - Data

Note that with the exception of three real items, everything else is phoney data. That's on purpose. It's easier to develop a program from a clear, unambiguous set of data. This is especially true of a program such as this where we're dealing with the same data presented in a differing order. To avoid a nightmare of confusing indexes, sample data allows you to check that items which belong together really come up that way. Once a program is working, you can stick in any data you wish. A coding note: if you put REMs in data lines containing character strings, make sure that the colon doesn't mess up your string —it should touch the last data item, else "w10" may read in as "w10   " and you'll have a mess. Another thing to know about data is, that if it is to contain capital letters, leading spaces or commas or colons, the items must be enclosed in quotes.

Sample Test Output

1. cat	answer	1. meow
2. bird	answer	2. a14
3. w03	answer	3. a07
4. w04	answer	4. a15
5. w05	answer	5. a19
6. w06	answer	6. a04
7. w07	answer	7. a08
8. w08	answer	8. chirp
9. w09	answer	9. a17
10. w10	answer	10. a06
11. w11	answer	11. a18
12. w12	answer	12. a16
13. w13	answer	13. a10
14. w14	answer	14. a13
15. w15	answer	15. a03
16. w16	answer	16. sssssss
17. w17	answer	17. a09
18. w18	answer	18. a12
19. w19	answer	19. a11
20. snake	answer	20. a05

Which answer # matches w19? <user types 5>
Computer says 'correct' since fifth line matches w19-a19 pair.
Similarly, to match word #20 (snake) the answer number is 16.

Before typing this program, read "How to Enter Programs" and "How to Use the Magazine Entry Program." The BASIC programs in this magazine are available on disk from Loadstar, P.O. Box 30007, Shreveport, LA 71130-0007, 1-800-831-2694.

Test Program

```
120 N=20:REM HOW MANY PAIRS'CQEC
130 Z$="00000000000000000000"
    :REM N OR MORE ZEROS'CPCH
140 B$="[39 OR 79 SPACES]"'BCVE
150 D$=CHR$(17):U$=CHR$(145)'EOBF
160 MS$(0)="IS WRONG, THE ANSWER IS
    "'BGAJ
170 MS$(1)="CORRECT"'BGRG
180 DIM W$(N),A$(N),CA(N)
    :REM WORDS,ANSWERS,CORRECT#'CPNO
190 FOR J=1 TO N:READ W$(J):NEXT J
    :REM WORDS'GRML
200 FOR J=1 TO N:READ A$(J):NEXT J
    :REM CORRECT ANSWERS'GBAG
210 PRINT CHR$(147);'CGKY
220 HT$=LEFT$(Z$,N)'CJFB
240 REM WHILE COUNT <=N LOOP#1'BTEF
250 FOR KT=1 TO N'DETD
260 :  GOSUB 550 :REM GET A RANDOM
    NUMBER'CVMI
270 :  V=KT:GOSUB 520:PRINT". "W$(KT),
    ,:'DSSJ
280 :  PRINT"ANSWER ";:GOSUB 520
    :PRINT". ";A$(RN)'DOVL
290 :  HT$=LEFT$(HT$,RN-1)+"X"+MID$
    (HT$,RN+1):REM X=USED'IEJR
300 :  CA(RN)=KT :REM CORRECT ANSWER
    CROSS-REFERENCE'CNPI
310 NEXT KT :REM END LOOP#1'CMDC
330 HT$=LEFT$(Z$,N)'CJFD
340 PRINT D$D$D$;'BHMD
350 REM WHILE COUNT <=N LOOP#3'BTGH
360 FOR KT=1 TO N'DETF
370 :  GOSUB 550:W=RN'CIRH
380 :  PRINT U$U$B$'BHRH
390 :  PRINT U$"WHICH ANSWER# MATCHES
    "W$(W)"[SPACE2]";:A$=""'CMZQ
395 :  HT$=LEFT$(HT$,RN-1)+"X"+MID$
    (HT$,RN+1):REM X=USED'IEJX
400 :  INPUT A$:IF A$=""THEN END'FGNC
410 :  XX=VAL(A$)'CHXC
420 :  PRINT B$:PRINT U$U$'CIDC
430 :  FC=0:IF CA(W)=XX THEN C=C+1
    :FC=1'HTMK
440 :  PRINT W$(W)" - "A$"
    : "MS$(FC);'BQDH
450 :  IF FC=0 THEN PRINT" "CA(W);
    'EKVH
460 :  PRINT'BBKE
470 NEXT KT :REM END LOOP#3'CMFJ
480 PRINT C"CORRECT,"N-C"WRONG"'CDOL
490 END'BACH
510 REM---FORMAT NUMBER'BPRE
520 PRINT RIGHT$(B$+STR$(V),2);
    :RETURN'FLRG
530 REM---GET A UNIQUE RANDOM NUMBER,
     FLAG USED WITH X'BOMN
540 REM WHILE RND# ISN'T NEW DO
    LOOP#2'BACK
550 FOR J=1 TO 1E3:RN=INT(RND(1)*N+1)
    'IPIM
560 IF MID$(HT$,RN,1)="X"THEN NEXT J
    :REM END WHILE LOOP#2'GBFP
570 REM OK, WE HAVE A NEW RND#'BRUL
580 RETURN'BAQH
600 DATA CAT,BIRD,W03,W04,W05,W06,W07,
    W08,W09,W10'BPJJ
610 DATA W11,W12,W13,W14,W15,W16,W17,
    W18,W19,SNAKE'BQML
620 DATA MEOW,CHIRP,A03,A04,A05,A06,
    A07,A08,A09,A10'BROL
630 DATA A11,A12,A13,A14,A15,A16,A17,
    A18,A19,SSSSSSS'BTIN
```

END

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by Gary V. Fields

KIDS ON KEYBOARDS

TRAINING FOR THEIR FUTURE

Does a child exposed to computers really gain an edge? If a child shows no interest in computers, should you be alarmed? What is the best age to introduce a child to computers? These are just a few of the questions answered in this in-depth look at computers and children.

To answer questions like these, I talked to three educators in North Carolina: June McCraken, computer coordinator for the Asheville City School system; May Matthews, computer specialist for the Buncombe County School system; and Harold Miller, mathematical psychologist and computer consultant in Arden, who heads the computer department for Asheville Country Day School.

The first thing most parents will be relieved to know is that none of the educators equated computer literacy with being able to program a computer. They see no reason for alarm if your child graduates from high school knowing Spanish but not Pascal. What does concern them is the possibility of your child finishing high school without adaquate hands-on experience with a computer.

It is a rare parent who doesn't want the best for his/her child. Unfortunately, knowing what is best isn't always easy. Knowing how to prepare your six year-old to compete in the twenty-first century requires more than guess work—so here are some guidelines.

Is there an ideal age to introduce the child to a computer?

McCracken: In our schools, the computer program is structured so every child has access to a computer. We like children to begin working on the thinking skills—the process of which information is moved into and out of a computer—in kindergarten or first grade. Computers manage imformation sequentially. If big problems are broken into several small problems, they become manageable. It's important that children learn to think problems through in this way as early as possible.

Matthews: I don't know, but kindergarten children sure pick up on things quickly. It's like they already know how to do things. It's incredible. They are very excited about using computers.

Miller: If you can have one in your home, I wouldn't draw a line on age. I have a friend whose two year-old runs programs with a mouse.

Do computers develop any skills better than traditional teaching methods?

Miller: The computer is really good for hands-on experience teaching things like graphics or robotics. This way, students learn physics, mathematics (LOGO is a very geometric language), and music. The greatest thing about a computer is that it is empty. You make it into anything you want. I think that's fantastic. When you turn them on they can be anything you want them to be. I let the software attract the students to the computer.

I view computers as an extension of the mind. It allows you to do on the screen what we used to do only in our minds. In our minds, we are constantly cutting and pasting thoughts—but cutting and pasting in the real world is pretty hard to do. The computer frees you to think creatively on something besides your brain. In that sense, it is an extension of your brain. Computers expand a child's creative potential.

Matthews: We use them for drill and practice in the lower classes where they have proven very effective, although all students don't find that type of instruction particularly motivating. I think the best use of a computer is in problem-solving applications. The computer can simulate problems which would be difficult to introduce otherwise. The children are free to revise their thoughts and think again and again, which normally can't be done in the classroom. Computers are very patient teachers.

I'm sure every parent has wondered if computer games are good for a child. Should a parent control which games the child plays?

Miller: It depends upon the game. I think good simulation games are excellent experiences for the child. I don't have much use for video games.

McCracken: The right kind of game is fine. The game should be something that requires more from the child than just pressing a button. Parents should be selective in the choice of games they bring into the home.

Matthews: If you want the child to actually learn something, you need to selectively choose the software. I agree that simulation games are among the best, and most children enjoy them. The key is stimulating the child to think independently. For young children I like to see games that teach letters, shapes and colors. Then we introduce



DENNIS DEGNAN Stylist: Tiana Jones

software that helps them with counting or games which require picking out what is different in a picture.

What types of games should parents encourage their children to play?

Miller: Get your child involved with good simulation games. I love SubLogic's *Flight Simulator.* The new version allows you to connect two computers by a null-modem cable so two students can fly together. It's not a war game so you can't shoot each other—the kids would love to be able to do that—they fly together. I teach flying that way. I'll say, "Now you follow me on my tail. Keep me in your window." We'll do loops, banks, land, whatever. Kids eat it up. Plus the children have to work together on two different machines. We need to see more software designed that way.

I like the games where the child must practice a skill. A good example is a game that requires the child to read a map. Computers were designed to give you access to facts about the real world, and good games should embrace that power.

A computer is a window to the real world. They give you the chance to try your ideas on the screen before you try them in the real world. Computers help children that are not good at visualizing and imagining things. I hope that when they return to the real world they take some of that screen with them. Hopefully, it becomes part of their imagination. I like games that make children use their imaginations. Most shoot'em-up games do not do that.

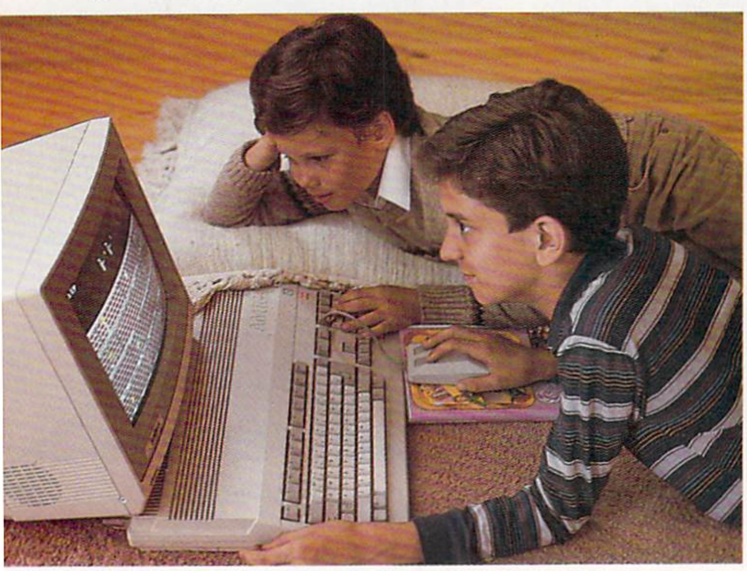
McCracken: It should be a thinking game — a game that makes you think "if I push this button this will happen, but if I make this choice, this other thing will happen. Which would be better?"

Matthews: Any game that requires the child to think. Better still, the game should require the child to use reference material. A good example would be Broderbund's two *Where is Carmen Sandiego?* games.

Is the time using the computer in school enough? Is a home computer more helpful?

Miller: I think it's great for a student to have a computer at home. I think it's great for a family to have a computer. I would never force a computer on a family, but I strongly encourage it, especially if the child shows any kind of interest. I do tell the parents not to buy video games, but they always do. A computer should expand the child's view of the world. They should exercise their brain when they play a game.

McCracken: If a child really likes working with a computer, he or she probably doesn't feel they get enough exposure at school. But the parent certainly should not feel guilty if they do not have one in the home—as long as their school system provides them. Now if the parents have the resources to buy one for a first or second grade student, that's fine. Children that age can do things with them.



And it's always nice if the child has the same tools at home they have at school, but we certainly don't require it. The advantage of a system at home is that the parents can enjoy them too.

Do children who use home computers do better in traditional classes?

McCracken: I suspect that students exposed to computers do better. I know children who use word processors almost always turn in better papers than they would have if they had not been able to preview and easily revise their work. We've also seen an improvement with the students enrolled in our Chapter One (Federally funded) program. Computers are making a difference there.

Matthews: I don't know if that is true or not. It's been my experience that students with computers at home do better in my computer science class than those who do not, but that may be true simply because they have more chances to practice their skills.

If a child shows no interest in learning or using computers, should a parent be alarmed?

Miller: Young children come to computers when they are ready. I would not push them if the child isn't interested. Now, if the child is approaching high school and hasn't had any hands-on experience, I would be upset. It's good that schools require some computer studies.

McCracken: I wouldn't be alarmed. I would try to make the child aware of all the computers around them. You know, point out the computers in the bank or grocery store and show the child how important they are in our everyday activity.

Matthews: Some students are simply not going to be as interested as others. I do think children should be exposed to computers. What children don't find interesting at age 11 they may find very interesting at age 16. The important thing is that they have the opportunity.

A computer is a window to the real world. They give you the chance to try your ideas on the screen before you try them in the real world.

What should a parent do to interest their child in computers?

Miller: I don't think there is a lot a parent can do. You can't push these things on a child. When they are interested, they go to them. I think it's important that schools require children to attend some classes so they get a chance to taste the thing and make up their own mind.

Is computer knowledge going to be as important in our children's life as we are lead to believe?

Miller: Children should be prepared because their future will be filled with computers. Computers are going to be accepted as just another tool. You pick up a hammer and use it, you pick up a computer and use it. It's important to know how to properly use tools. It's as simple as that.

I'm not overly concerned with young students, five to ten—they were born into the computer generation. The ones I worry about are the older kids, high school and older. They were born too soon. They didn't have the chance to grow up with computers in their home like the young ones do.

The students who will have trouble in the real world are the high school age kids who never got the chance to become familiar with computers. There are presently universities in the Northeast and California which require that the student bring a computer to class. It's like a notebook. Parents see the importance of computers and the teachers see it, but the students don't. Some of our eleventh and twelfth graders would be lost trying to go to one of those schools— they wouldn't know how to function in a school like that. So in a sense, the student without computer knowledge is limiting opportunity.

McCracken: I think it will be. I don't think children necessarily need to know how to program the computer, but they need to know how to use it to enhance their living. And they shouldn't wait until they're almost out of high school to begin to study. They should begin using them in first grade.

By the time the children in school today are ready to join the work force, computer skills will make a difference in their earning ability. This is going to affect the people in the middle income range more than those people in the upper income range.

Should parents be alarmed if children spend too much time with their computers?

McCracken: It depends upon how the computer is fitting into their other after-school activities. If the interest in the computer interferes with physical and social activities, then yes, I would be concerned. If the computer is only cutting into the time the child normally watches television, then I wouldn't object. I don't think it's good for

You know, point out the computers in the bank or grocery store and try to show the child how important they are in our everyday activity.

the child to spend hours and hours sitting at the computer. Children need to have well rounded interests.

What ratio between student and computers now exists in your systems?

Miller: Our ratio between students and computers is about 15 to 1. I think that is pretty good.

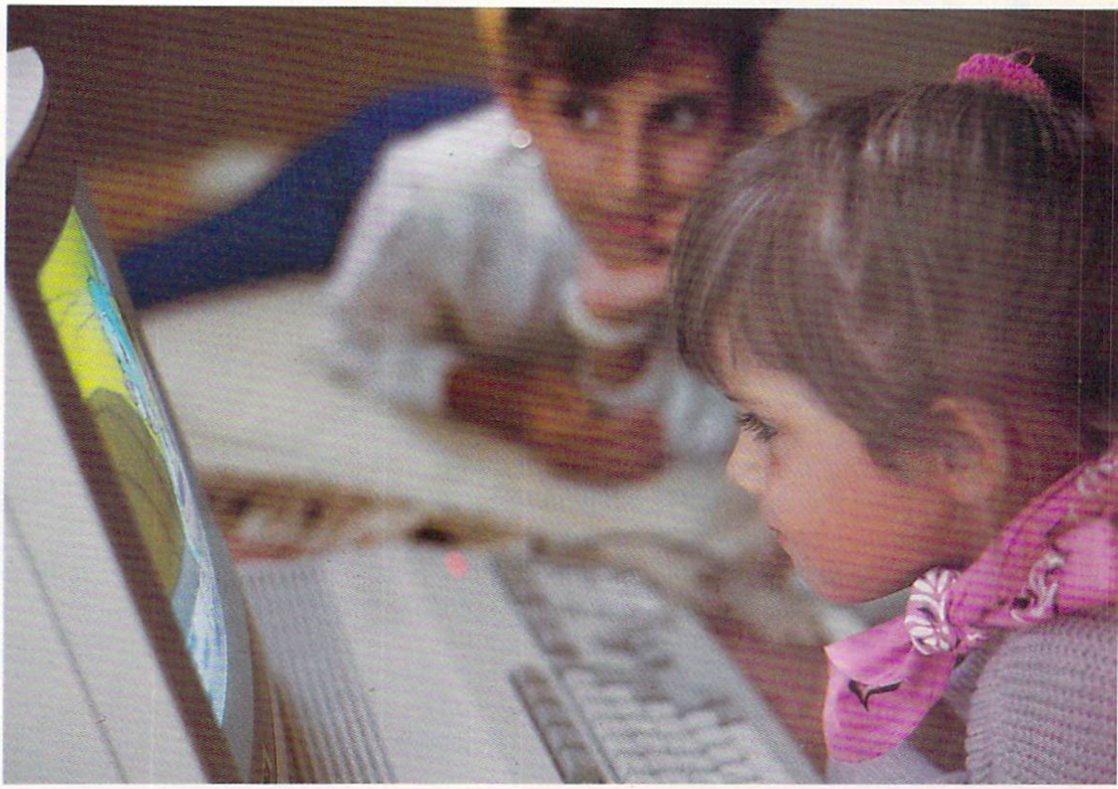
The computer frees you to think creatively on something besides your brain. In that sense, it is an extension of your brain.

McCracken: We have 1 computer for every 17 students.
Matthews: Right now we have 1 computer for every 28 students. I think that's pretty good, but not as good as we'd like. North Carolina was funded for a ratio of 1 to 50, which was thought as adequate, so we're happy with the ratio we have.

Has the introduction of computers in the classroom made a measurable difference in the amount of knowledge a child absorbs as compared to pre-computer years?

McCracken: I'd like to think that is true, but not enough children have been exposed to computers in school long enough to accurately compare groups yet. There hasn't yet been a child who has gone from kindergarten to graduation using computers. But I do know on the high school level, computers have helped improve thinking processes by the use of word processing. The papers they are turning in have improved.

Most children like computers, so using them as a tool is good experience. Computers are helping both gifted as well as disadvantaged children. It gives both an alternative learning style.
Matthews: I haven't seen any studies that address that question. As the children move out of our kindergarten program, we'll be able to see if that is true. Right now we are just waiting.



I think parents of girls should encourage their daughters to investigate computers. As girls see more and more women using computers, I think they will be more attracted to them.

Does the sex of a child make a difference?

Miller: Yes, I've seen a difference. Girls in general are more graphically-oriented and more creative. They don't seem to be so interested in the intellectual side. Boys, on the other hand, like to write their own programs—control things. At our school we have an after-school class that kids are free to take. That class, ages 10 and younger, is split about 50/50.

If the computer is in the home and the child sees the parent using it, they'll want to do what their parents do. I think that's why boys seem to be attracted to computers more than girls. The son sees Dad using the computer and he wants to do the same. Parents are role models. If you want your daughter to be interested in computers, I guess the mother needs to be interested too.

There are two kinds of kids as far as computers are concerned. There are the kids who are attracted to computers as a tool. They want to see what they can make it do. Then there are the children who need to see an immediate application for the computer before they will get involved with it. My wife was like that before computers had windows and a mouse. She wouldn't get near the thing. Now I can't get near it because she uses it for word processing and designing graphics.
McCracken: The sex of the child does not affect his/her ability to use computers. But boys do seem to take to computers quicker than girls. It may be just because boys are a little more aggressive than girls and get to the computers in our labs first.

I think parents of girls should encourage their daughters to investigate computers. Now our classes are designed so girls have the same chance to use the systems as boys. As girls see more and more women using computers, I think they will be more attracted to them.
Matthews: Girls sometimes feel excluded from computers if the environment around them is very competitive. I've always had a good mixture of both girls and boys in my classes, but I'm a female teacher so that may have made the difference. I think role modeling is important. If you want the child to use the computer, it's important for the child to see the parent use it. *Continued on pg. 108*

CINEMAWARE

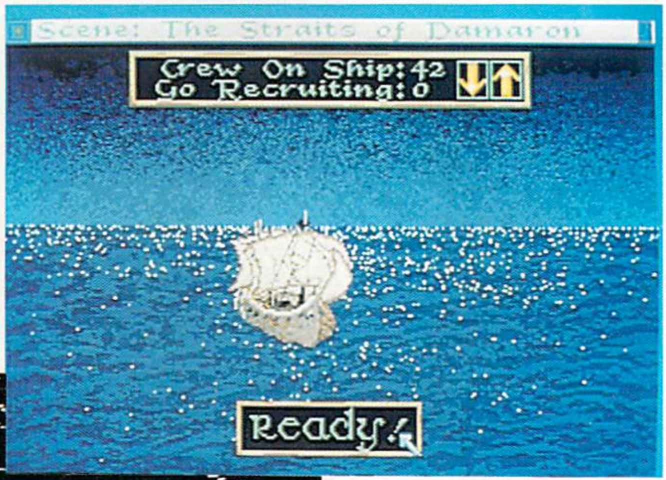
A New Breed of

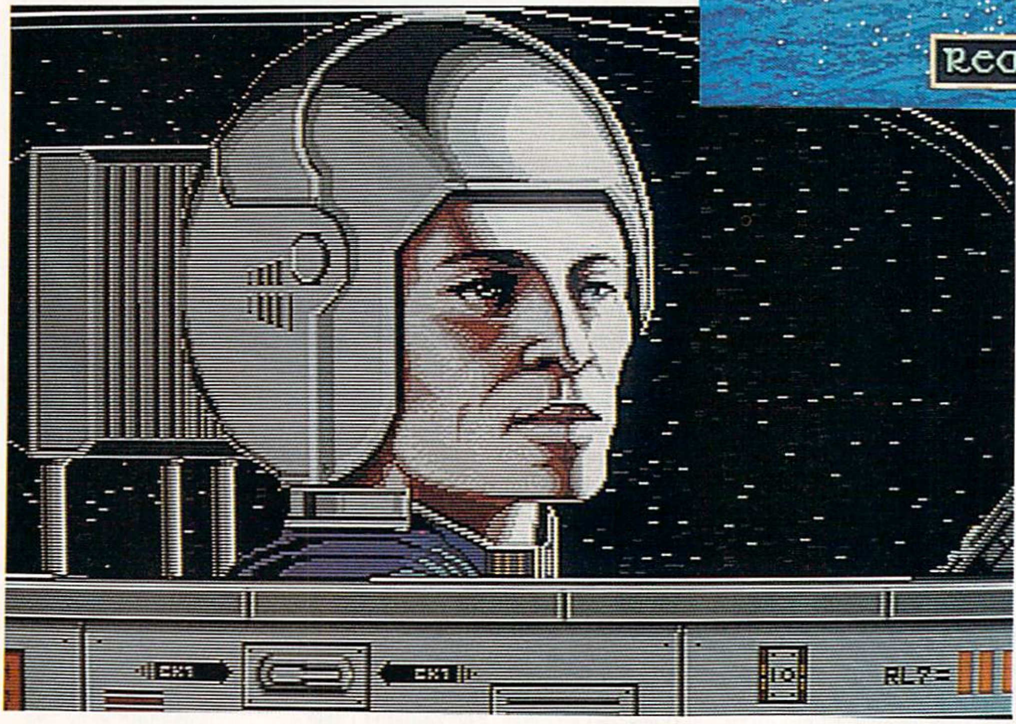
AMIGA SOFTWARE

by Gary V. Fields

S.D.I., Sinbad and the Throne of the Falcon *and* Defender of the Crown

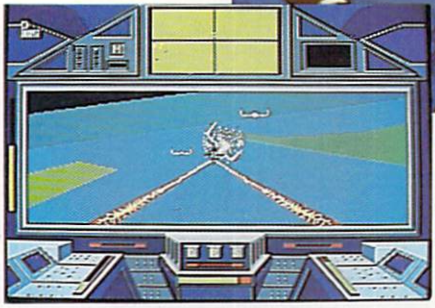
Mindscape, Inc. has recently begun taking the Amiga software industry by storm with the release of the Cinemaware titles from Master Designer Software. The first title, Defender of the Crown, *won the 1986 award for Best Graphics (16-Bit Division) from the Software Publishers Association. Here are reviews of the second two titles,* S.D.I. *and* Sinbad and the Throne of the Falcon, *along with a behind the scenes look at the creation of* Defender of the Crown.





In a word, *Sinbad* and *S.D.I.* are the prime cuts of today's adventure menu.





As Captain McCormick, you must defeat a fleet of KGB space fighters and use S.D.I.'s defense lasers to thwart wave upon wave of Russian missiles.

S.D.I. and *Sinbad* are both interactive games for the Amiga which mix interesting storylines with arcade action, eye-boggling graphics, logical command sequences and realtime challenge. This is all packed in a movie-like environment, complete with screen-titles and credits. But the stories are about as far apart as the planets. *Sinbad* is rooted in the mysterious, mythical storytales of centuries past, while *S.D.I.* is as current as today's headlines and as chilling as tonight's nightmare. Yet both mix one-on-one challenge with strategy, surprise, freshness, variety and an occasional romantic interlude.

It's hard to believe it was only four years ago when I was amazed with the first version of *Zork*. In that brief interim the improvement adventure games have undergone can only be described as awe inspiring. These two are true to the *Zork* heritage for being enjoyable, unpredictable, challenging and interest-riveting. But to put these two in the same category as those early adventure programs would be like comparing filet mignon with vienne sausages. Both are eatable, but only one is a feast. In a word, *Sinbad* and *S.D.I.* are the prime cuts of today's adventure menu. I did find a little grizzle on both I wish had been removed (more about that in a minute) but for the most part both are to my liking.

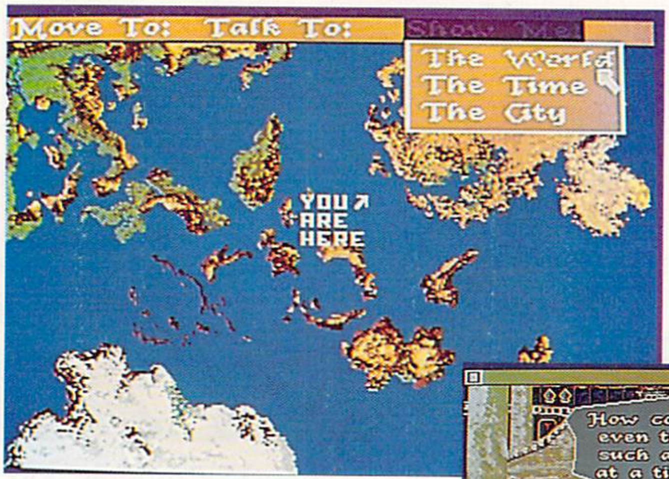
Sinbad And the Throne Of the Falcon turns back the pages of adventure to the legends of the Arabian Nights. The screen truly comes alive in the most realistic ways in this Amiga version of the adventure. You assume the character of Sinbad the sailor who has been summoned to the court of the Caliph in Damaron, father of his childhood sweetheart, Princess Sylphani. An evil spirit has transformed the Caliph into a dying falcon. Your job is to search the dangerous mythical world created by the program and find and destroy the evil which has visited the throne. A time limit (displayed as sand passing through an hour grass) is enforced and dozens of obstacles, physical, magical and sensual will be placed in your way. To aid you on your quest you can talk with the Princess, a gypsy, a genie, a shaman and Libitina — a vamp in every sense of the word. Conversations with all can vary from casual to highly helpful, but only Libitina knows how to show a sailor a good time (yes, you read between the lines correctly).

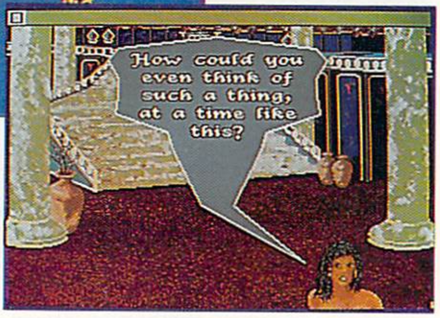
To complete the adventure you must unravel the mysteries of the Caliph's transformation. To accomplish this you must converse with the characters you encounter, navigate and explore the seas surrounding Sinbad's huge mythical world, gather a crew to sail your ship and fight for you, defeat the Black Prince and his army, and recover the three jeweled eyes of the Ishtike idols. And if that's not enough, you'll have to fight evils like huge Cyclops, evil smelling Pteronoxos, winged lions and nimble-footed, sword-totting, death-defying skeletons. Once you get past all those, things really get tough.

Each challenging encounter is executed under joystick control rather than a mouse. This means you must have both a mouse and a joystick plugged in before beginning your exploration. I initially objected to this requirement, but after losing my sword fight with the skeleton a couple of times, I saw the wisdom of using the traditional arcade input device — these encounters with death are executed at true arcade speed. One wrong twist of the joystick and the onscreen blood you see splattered will be your own. The realistic graphics displayed here are shown in detail almost to an objection (sword fighting can be messy).

The game includes an option to save your spot so you can return to that point later and all options, including conversations, are activated by using the mouse to pull down a menu from the status line. This makes controlling Sinbad, moving from location to location and making decisions fast and as easy as pointing. Conversing with the characters you meet on your travels is not done in the traditional adventure method. Rather than input your messages on the keyboard, the menu lists the three or four statements which are appropriate for each situation. Purists in the adventure audience may object to these limitations, but I personally found the method refreshing. If nothing else, it prevents you from wasting valuable time chatting about nonsense, and keeps you on the important matters at hand. If there are any objections at all to the mouse interface employed here, it would be that it spoils you against games that don't use it.

The game *S.D.I.* is as far from the age of Sinbad as night and day and is as timely as the challenge and threat we may face tomorrow. S.D.I. stands for Strategic Defense Initiative, which is normally referred to in news reports as Star Wars. Again you assume the role of a movie





To aid you on your quest you can talk with the Princess, a gypsy, a genie, a shaman and Libitina — a vamp in every sense of the word.

character in this graphic/arcade/adventure game. But unlike Sinbad who is concerned primarily with the well-being of one person and one country, the hero of *S.D.I.*, Captain Sloan McCormick, is responsible for the safety of millions of Americans and the other unnumbered free souls around the world.

The scenario in *S.D.I.* is this: a revolution is taking place in the Soviet Union, sparked in part because the United States is close to completing the S.D.I. defense shield, which the Soviet military is afraid will be used as an offensive weapon. In the middle of the revolt, the KGB seizes key Russian military missile sites and launches an attack on the S.D.I. satellites. Once the satellites are disabled, the KGB begins an actual nuclear offensive against the United States. In an odd turn, Moscow requests U.S. help to end the revolt and puts their own space station at McCormick's disposal. The station is commanded by Natalya Kazarian (she looks like one of the ladies of pleasure and power so popular in James Bond movies), a woman you'll want to meet.

Before you can rest, as Captain McCormick, you must defeat a fleet of KGB space fighters, use S.D.I.'s defense lasers to thwart wave upon wave of Russian missiles, and go to Natalya's defense. To succeed, you must fly and fight with a super spacefighter, wisely command the S.D.I. shields, repair damaged satellites, and dock with both the U.S. and Soviet space stations. Before it's all over, you'll have to fight your way — with laser gun blazing — through the corridors of the Russian orbiting headquarters to find and save Natalya. But take my word for it, this Russian female is worth saving. Unlike *Sinbad*, *S.D.I.* offers no option to save your place in the "movie" — the conflict here is win now or lose.

The graphics employed in *S.D.I.* have to be seen to be appreciated. The control room scene in the orbiting space station is perfect in even the smallest detail — color, dimensions, lighting effects, huge map screens, animation, flickering panel lights, etc. The display which represents Captain McCormick is proportional and realistic in detail, coloring and action. The view out the front of McCormick's starfighter is three dimensional and all you would expect or want from an arcade game. It took some practice for me to get used to the ship's controls and gauges (a mixture of joystick and keyboard input). Unlike the dial controls in an airplane, the starfighter uses bar gauges to indicate speed, fuel and energy. At full speed the gauge was solid red while decreasing speed made the bar drop like the liquid in a thermometer. I would have preferred number readouts, but with time I adjusted to this display scheme.

When you leave the orbiting station, your job is to destroy attacking fighters and keep the system's satellites repaired so they can be used when the actual missile attack begins. I found it difficult enough to fight off the KGB bad guys who were trying to dust me, much less repair satellites. But it all can be done if you practice, and practice and practice. After you've completed all the repairs you can, you must dock with the space station, repair and refuel your ship, and return to control headquarters to direct the defense against the missile attack.

Again the graphics are outstanding and almost too realistic. You'll know what I mean when you view the incoming nuclear tipped missiles and the screen shows they are targeted for your hometown. Knowing that this scenario could come to life any day, it's hard not to feel a little uncomfortable "playing" this war game. After each missile wave you must return to space to repair the damage done to S.D.I. and go at it again with the KGB. Eventually you'll get a call from Natalya that her command station has been overrun and asking for your help. Actually you can dock at the Russian station any time you wish, but the chances of finding Natalya are slim without her request.

Inside the Russian space station you must fight the invading KGB agents while moving through the corridors. If you saw the scene from the first Star Wars movie where the Empire's storm troopers captured the princess, you'll have a good idea of what the fighting in the space station looks like. Your options here are to dodge, shoot or run. (Hint: when you hit one of the bad guys, keep shooting him until he is dead. A single shot will only slow them down, but a steady zap will clear that opponent from your path.)

You'll know what I mean when you view the incoming nuclear tipped missiles and the screen shows they are targeted for your hometown.

Eventually you will reach the room where Natalya waits. You'll know you are in the right place when the screen displays the room shown on the cover of *S.D.I.* And let me tell you — that Russian woman is glad to see you — wow.

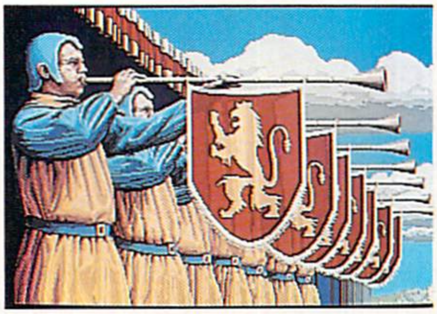
As I suggested above, both games are wonderful, but not perfect. *S.D.I.* has no option to save your spot during play as *Sinbad* does. (You can however "pause" the action to catch your breath.) Apparently a "save" option was omitted because *S.D.I.* is more an arcade/action game with great graphics while *Sinbad* more resem-

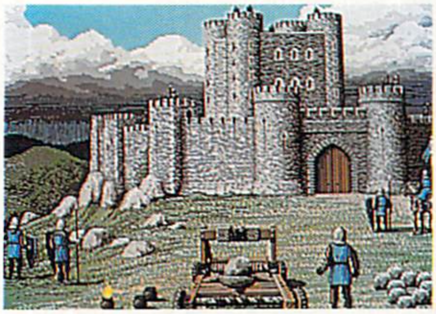
Continued on pg. 117

Designing a Hit

by Matthew Leeds

The creation of *Defender of the Crown*







A catapult tosses rocks at a medieval castle as the assembled seige troops look on. Slowly, the walls of the castle crumble under the attack. The troops rush the walls of the castle as the inhabitants flee or vainly attempt to defend themselves. Another territory falls and is added as a vassal to the conquering lord. This is one of the scenes from *Defender of the Crown*, a game from Master Designer Software that breaks new ground in several areas. It's the largest game ever shipped, completely filling two Amiga disks (at 880KBytes each). It has the most detailed graphics of any game I've ever seen, and also some of the most lifelike action. The president of Master Designer Software, Bob Jacob, says, "One thing I think people will be able to say about us is that we were not afraid to take chances. There's no question we're setting a new standard for computer games."

Several people played important roles in the development of *Defender*. The project started when Kellyn Beeck brought the preliminary design specifications for a game based on the Robin Hood concept to Bob Jacob. The six page outline covered many of the elements that made their way into the final game: the time period of the game, the sword fighting and jousting, the concept of income from territories, raids and ransoms, and many other important components.

One other important phrase appears in this early draft, 'interactive movie'. This description has been used in virtually every article and ad regarding *Defender*. The idea is that the game becomes 'a work of entertainment that draws you into an animated world of castles and kings, valiant knights and bold adventurers'. This is an apt description of *Defender*.

Four months later, in mid-July, the Robin Hood game had evolved into *Defender*. Elements of the earlier design could still be seen in the latest draft of the design outline; Sherwood Forest, Saxons and Normans, and the ability to ask Robin for assistance. For the most part though, the game had taken the shape it would finally appear in. The map of England had been finalized, details of each module had been worked out, and the important algorithms that govern the play of the game had taken shape (more on this later).

Meanwhile, Jim Sachs had been contacted to do the art for *Defender*. For those of you who do not know Jim Sachs, he has become one of the best known of a small group of artists who create graphics for computer games. His work is immediately recognizable by its realism and attention to detail. Work was begun on what was eventually to be the largest amount of art contained in any microcomputer game to date, almost 1.5 MBytes.

Jacob then called Jim Cuomo in France to develop the music for *Defender*. Cuomo had been living in Europe for the last eleven years, coming to the States on occasion. He has been recognized as an innovator in electronic music, and has several records released in France. They had first met during a trade show, and stayed in touch. Jacob was certain that he would find a project for Cuomo at some point. He was right.

Finally, R. J. Mical was brought in to do the programming that would tie all the elements together. Mical had been a part of the team that developed the Amiga, and was ideally suited to handle what by now had become a project larger than anyone had imagined. His job was to create a game program that would be faithful to Beeck's design, incorporating Sachs' art and Cuomo's music, and to meet a deadline of two and a half months.

Coordinating all of these individuals, keeping the channels of communications open and active, and maintaining a perspective on the overall project was the job of John Cutter, Director of Product Development at Master Designer. Cutter is best known for his work with Gamestar. He designed the *GBA Basketball* game distributed by Activision.

Tinkering behind the scenes of *Defender of the Crown.*

A lot goes into designing a game. Every screen, every option, the timing of events and the user interface all need to be planned in advance. A system to determine the outcome of every event must be devised, and it must be integrated into the rest of the program since the outcome of any event should effect the rest of the game. The tool a game designer or programmer uses to handle the mechanics of game play is an algorithm. This is a mathematical formula that takes into account every variable element of a game that affects the possible outcome of an action.

I'll use one example from *Defender* to illustrate. Two armies can face each other in battle. How does the game decide which will win the conflict? Armies are represented on-screen by one soldier being shown for every fifty men-at-arms in the army. If there are knights in the army as well, one knight is displayed. There are three tactics available during a battle: ferocious attack, stand and fight, or wild retreat. We'll just consider the stand and fight option. Get out your pencils and follow along.

Here are the two algorithms used:

Attacker losses =
(DS*3 + DK*5-
(S*2 + K*8) + RND)/L

Defender losses + (S*2 + K*8-
(DS*3 + DK*5) + RND)/DL

Now to explain what each variable is:

S = # of attacking soldiers
K = # of attacking knights
L = attacker leadership rating
DS = # of defending soldiers

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THE ELECTRONIC COCKTAIL PARTY

Telecommunications Gives Birth to a New Language

by Dan Gutman

Computer owners across the country are developing a new language. The messages that people are sending from computer to computer over phone lines are different from conventional communications. This new language is part visual, part verbal and part symbolic.



The New CB—Electronic Cocktail Parties

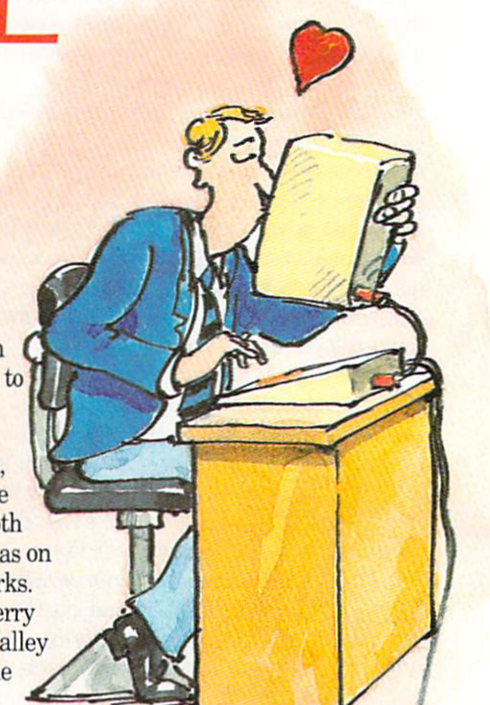
I went to a wild party the other night. Needahug was there. So were Boy Toy 69, Rambo 20, Captain Space, ImaBadGirl, Mr. Nice, and Jello Man. We all had a great time. The amazing thing was that we were scattered over the Northern Hemisphere.

It was just another night on the CB Simulator.

The CB fad (citizens band) hit it big back in the seventies, when people all over the country were buying CB radios for their cars. The craze didn't last very long, primarily because drivers don't have a whole lot to say to one another besides, "Watch out for Smokey" and "10-4, good buddy."

But mass communication is no fad. Here in the eighties, CB is evolving. Every night, thousands of computer owners gather in front of their screens to chat with friends thousands of miles away. You'll find CB simulation on all the major information networks — QuantumLink, CompuServe, GEnie, and The Source.

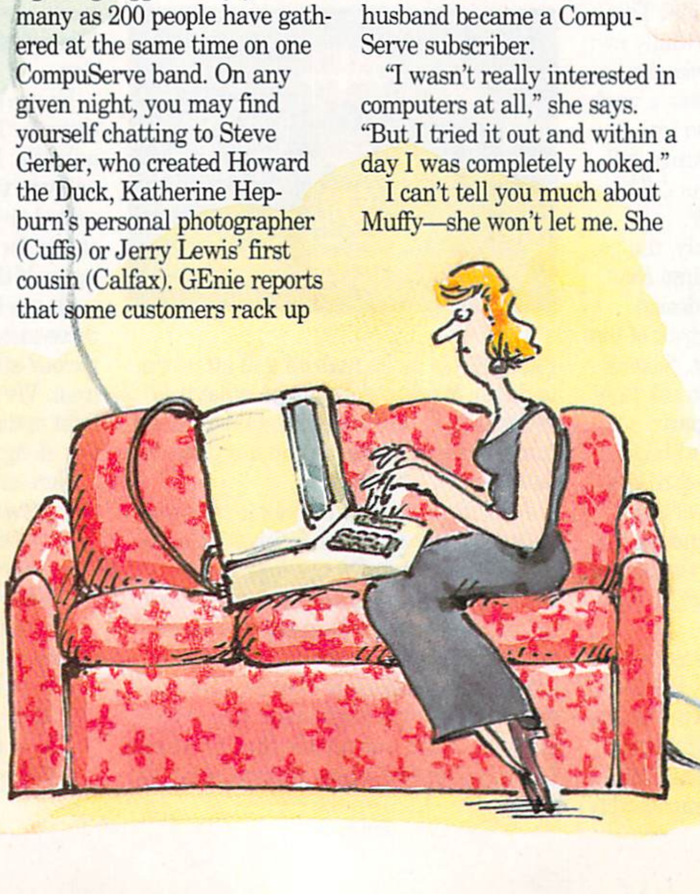
CB started with a small cult following in 1979 and it keeps getting bigger every year. As many as 200 people have gathered at the same time on one CompuServe band. On any given night, you may find yourself chatting to Steve Gerber, who created Howard the Duck, Katherine Hepburn's personal photographer (Cuffs) or Jerry Lewis' first cousin (Calfax). GEnie reports that some customers rack up on-line charges as high as $1,200 a month just to chat.



I chatted with two gurus of the CB crowd, CompuServe's Cupcake and GEnie's Muffy. Both watch over the CB areas on their respective networks. Cupcake is actually Terry Biener, who lives in Valley Stream, New York. She became a CB nut in December of 1981 when her husband became a CompuServe subscriber.

"I wasn't really interested in computers at all," she says. "But I tried it out and within a day I was completely hooked."

I can't tell you much about Muffy—she won't let me. She does admit this, though: she is divorced, somewhere between the ages of 21 and 50, and runs her own word processing business in Virginia. "I try to keep very anonymous," she claims. "I have nothing to do with Muffy. She's just some wacko who does this."



The Medium is the Message.

CB simulation looks something like this on your screen...

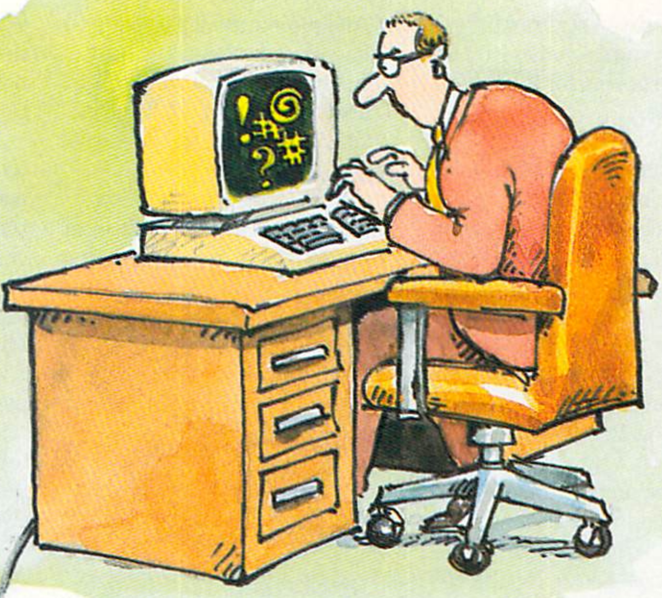
(FoxyLady) Hi all!
(Bill B) Yo! Get funky! How old, Foxy?
(FoxyLady) Old enough to know better, BB :-)
(Dweedledee) Mets STINK, Dweedle! Sox all the way!!!!!!!
(Bill B) Yo! Boston, how old? What do you look like?
(Mr. Ed) Let's go Mets!!! U watch the game last nite?

And so on. The words fly across the screen while unseen fingers pound keyboards. Every-

body's talking and typing at once. There are many conversations swirling around you at the same time, and people come and go. CB simulation is the electronic equivalent of a cocktail party. BYOB. But when you go to this party, you don't have to get dressed up. For that matter, you don't have to get dressed at all.

Each network usually splits up the CB section in their service into many bands, so that people can gather and communicate in smaller groups. Naturally, people tend to flock to bands that have people like themselves. On CompuServe, Band 1 is unofficially for adults, 17 is for children, 22 is for seniors, and 33 is for alternate lifestyles (gay and bisexual).

GEnie Muffy reports that many of the CompuServe alternate lifestyle CBers are also members of GEnie, and have claimed the same turf as their own. "They come over here and jump on channel 33," she says.





Critics used to complain that the computer isolated people from one another. In reality, the computer may be the most important advance in bringing people together since the invention of the telephone.

One Picture Is Worth a Thousand K

When we communicate in person, you get your point across by using facial expressions and body language. When you talk on the phone, you can change the inflection in your voice. You don't have these tools when you're on-line. But you *do* have the power of punctuation, repeating letters, and visual images. CB people use these to the fullest to communicate.

Just as :-) represents a smile, you can show unhappiness by turning the parenthesis around. Just type :-(. If someone makes you shed a tear, you can let the world know by typing :'(. Q-Link subscribers particularly like to use this visual shorthand.

Here are a few other symbols people use to express their feelings through their computers. For each one, turn your head to the side.

Laugh – :D
Wink – ;)
Sunglasses – B)
Surprise – :O
Bored: – :I
Sticking out tongue – :P
Kiss – :*
Kiss and hug – :*<>
Sending flowers – –>–>>+
Throwing up – :Q

There are other tricks. When you talk on the telephone, you can yell, scream, or slam down the receiver in disgust. To shout on-line, you can use CAPITAL LETTERS. If you need to get your point across, blast out some EXCLAMATION POINTS!!! Show'em you mean business. Hold down that ! key like you're firing a machine gun!!!!!!!!!!

Those repeating letters can be really expressive. Hahahahahahahahahahahhahahahahahaha!!! It can also be really obnoxious and harrrrrddddd toooooo readddddddd if youuuuuu overdoooooo it.

MYK (Minimize Your Keystrokes)

You'll often see abbreviations in computer chat. Instead of typing "by the way," just type "BTW." OTF means "on the floor" (as in "laughing").

LOL means "laughing out loud." Abbreviations make it possible to "talk" faster, which is important when the words of 20 other people are zipping across your screen. Not only does an abbreviation get your point across quickly, it also makes the people who understand it feel like they're part of the in crowd. It's kind of a secret language only for members of the club.

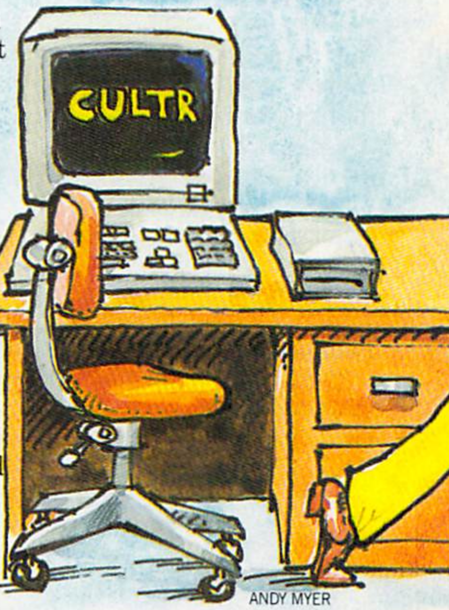
If you're feeling left out, memorize these:

OTW — On the way
AFK — Away from keys
BAT — Back at terminal
BRB — Be right back
GFD — Going for drink
FAS — For a second
FAW — For a while
ILY — I love you
ROFL — rolling on floor laughing
TTFN — Ta ta for now
IYQ2 — I like you too
CULTR — See you later
REHI — Hello again

Just the Facts, Ma'am

English teachers have yet to discover telecommunications. When they do, they won't be too happy. On-line grammar is horrendous. Nobody uses complete sentences. Typos and bad spelling are all over the screen.

Nobody cares. What matters is instantaneous communication. If you're in a chat mode



with 46 people all trying to elbow their way to the screen, there's no time to make certain you followed the i before e rule. You've got to say what you have to say and say it fast. "If you sit there and type a book, the conversation is going to go way past the subject," says CompuServe's Cupcake.

In reality, the computer may be the most important advance in bringing people together since the invention of the telephone.

Electronic conversation is closer to talking than it is to writing. When we write a letter, we've been trained since childhood to choose our words carefully and make perfect sense. When we talk, we mumble, stutter and change thoughts in mid-sentence.

Nimble fingers are an asset on CB. You can tell who the fast typists are because they simply "talk" more often. On GEnie, a group of CBers has developed their own code in which numbers represent groups of words. Typing "45," for instance, may be a way to say "this guy's a real jerk." Only the people who are part of the group have a list of what the numbers mean.

"CB stimulates the wit and the mind," says CompuServe's Cupcake. "I used to sit home with my three year-old discussing wallpaper with other mothers. After a few months of CB, I suddenly found my lost wit and I started thinking quicker."

There's another reason to think fast and type faster on CB. "We're talking money here," says GEnie's Muffy. When you're chatting on CB, you're paying for it by the minute.

To Tell the Truth

It's interesting how new technologies always seem to provide innovative and unusual ways for people to be dishonest. "You have the guys that like to jerk the other guys around by pretending they're women," claims Muffy. "And I know which ones they are," she adds. On CompuServe, Cupcake says she often sees children posing as adults.

But both CB experts agree that most people tend to be more candid in computer conversation than in real life. This makes some sense. With the computer, the person you're chatting with is invisible. You can't see a face or hear a voice. You may not know the people you're communicating with and you'll probably never meet them. You can say exactly what's on your mind. And because the words get wiped off

CB simulation is the electronic equivalent of a cocktail party. But when you go to this party, you don't have to get dressed up. For that matter, you don't have to get dressed at all.

the screen in a matter of seconds, they have the sense of impermanence.

It's easier to write an angry letter than it is to say the same words in person. It's easier to drop a bomb from an airplane than it is to pull a trigger on a gun aimed at a human being. And sometimes it's easier to be honest with a person sitting at a computer a thousand miles away than it is with someone sitting at the other end of your kitchen table.

CB is the great equalizer. On-line, nobody is better than anybody else. Nobody is better looking. Nobody makes more money or gets better grades. Nobody dresses better. Nobody knows what you look like, and

Abbreviations make it possible to "talk" faster, which is important when the words of 20 other people are zipping across your screen.

nobody cares. Nobody is black or white or prejudiced. The only thing that represents you are your words on the screen. Pretensions and inhibitions disappear.

Suddenly wallflowers become the life of the party. Stutterers become stand-up comics. True personalities emerge when our delicate psyches and neuroses are safely hidden behind the comfort of the keyboard.

"You're speaking on a mind-to-mind basis," says Cupcake. "Very openly. Sometimes a lot more openly than you can speak with a regular friend in real life." Cupcake reports that she has close friends who she has yet to meet face-to-face after four years. "There were several people who thought I was male for three years."

Muffy believes that in some cases, CBers come out of their shells on-line because "they can't interact in everyday life." But for most of us, it's the most honest communication there is. "It's what a person has in their brains and their heart, not what they look like," she says.

But CB isn't totally anonymous. Many CBers reach a point where their curiosity gets the better of them and they exchange physical descriptions and photos. CB parties have taken place around the country so people who have become friends on-line can get to know each other in person. At this point, CB becomes not so much a place to meet new people as a place to gather with your friends.

You #$%&ing $&U#

While CB is a new and exciting form of communication, there are some restrictions. All the networks monitor CB chat and warn against obscene or abusive language. The usual four-letter words are taboo on-line, so people generally fire off

"... People meet other people online, fall in love and they're already married to someone else. It gets a little messy at times."

a barrage of symbols on the top row of the keyboard. Like this...

"Bill, that's a crock of #$%U&*. John. P.S. Let's have lunch."

Foreign swear words will sometimes get by. Most Americans don't know what they mean, but they do know they're dirty. Just about any incomprehensible word with a k-sound looks dirty. There can be a lot of creativity in cursing.

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CompuServe, which has been through all this for eight years now, is a bit more resigned to loose talk than the other networks. GEnie's Muffy warns, "If they talk the way they do on CompuServe, I'll take them off the system. There are some sick people." Last year she had one teenage boy kicked off GEnie permanently for using foul language and sending dirty electronic mail—to her.

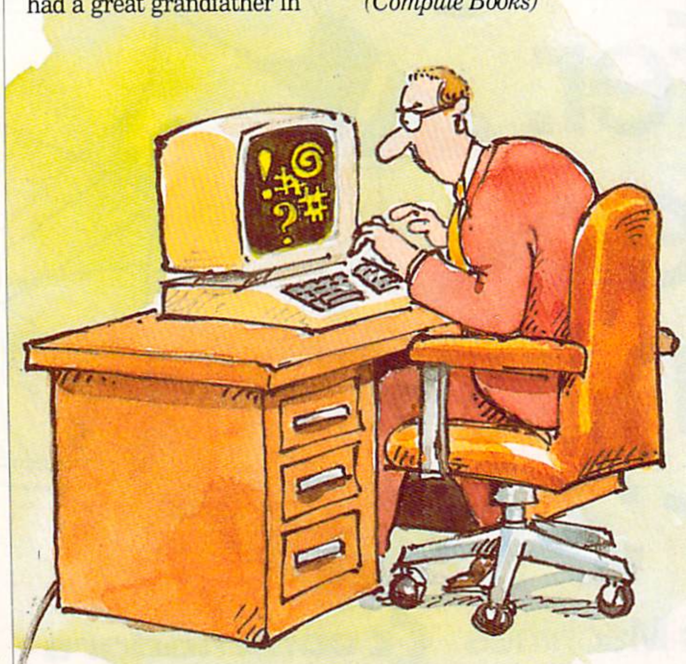
That doesn't mean you can't have fun and weird times on CB. A few years back, articles about people meeting online and getting married were common. Now, it's divorces. Kathy Anderson of Q-Link says she has seen a lot of them. "There have been marriages in jeopardy over this. People meet other people online, fall in love and they're already married to someone else. It gets a little messy at times."

Cupcake reports that strange coincidences have been happening with people who meet on CompuServe. One Oregon man was chatting for a year with a guy in Canada and they discovered that they are third cousins. Ferrarri from Kansas City and Bandit from Memphis discovered that they had a great grandfather in common. Then there's the Canadian guy who was originally from Argentina. He bumped into another Argentinian on-line and was thrilled to meet someone from his former country—until he found out it was his former girlfriend.

Both CB experts agree that most people tend to be more candid in computer conversation than in real life.

Last November, GEnie threw a Thanksgiving CB party where people showed up with handles like Giblet, Stuffing and Dark Meat. Muffy (who came as The Mufflower) recalls that things got a little out of hand. "They started an imaginary food fight. One girl picked up a pumpkin pie and threw it at a guy. He ducked and it hit another CBer." ■

Dan Gutman is a syndicated columnist and author of I Didn't Know You Could Do THAT With A Computer! *(Compute Books)*



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to run to make use of the file), a comment and any specific tool types.

To see what I am referring to, single-click an icon and then select the INFO option from the Workbench menu. All of the pertinent data will be displayed in various areas of the INFO screen. Of the items displayed, the Status is the only on-off type gadget. Click it and it will change from PROTECTED to DELETABLE. The other gadgets are of the STRING type where you would click somewhere inside of the border and then enter text or numeric information. In the case of the TOOL TYPES gadget, you have four additional gadgets. These are set up to allow you to add information that will be passed to the appropriate program to set up any defaults that you have selected. In the event of a custom program, the creators of the program will probably tell you what to place in this section for their specific program. As an example, let's take a look at a Notepad file that sets up some defaults before entering Notepad.

Notepad defaults to TOPAZ 80 for its font, so your file will be saved with TOPAZ 80 as its default font also (unless you change it in the actual file). If you were using a font called PICA and wanted this to be the default for your file, you would follow these steps:

1> Select your file's icon by single-clicking on it.

2> Choose the INFO option from the Workbench menu.

3> Click the ADD Gadget in the Tool Type section and click in the text entry area.

4> Type in "FONT=pica.8" (assuming an 8 point version of the font is to be used) and hit return.

5> Select the SAVE GADGET.

Now, when you open the file, Workbench will open Notepad, your file and automatically use the PICA font as your default font.

Tim Jones
Deltona, Fl

Amiga-N and Amiga-M: Even Workbench users touch the keyboard occasionally and here's one good instance. If you run a program that opens a new screen, not just a new window, then you may be at the mercy of the program as to whether you can get back to your workbench screen without quitting or deleting the software. Even worse, you may be stuck in a public domain demo program that won't let you quit without rebooting Workbench! If you press and hold down the left Amiga key (right next to the spacebar) and then press N, you will flip screens. Use left Amiga and M to flip back. This is a keyboard equivalent to the pop and push gadgets in the upper right hand corner of most screens and windows.

Dan Schein
Commodore

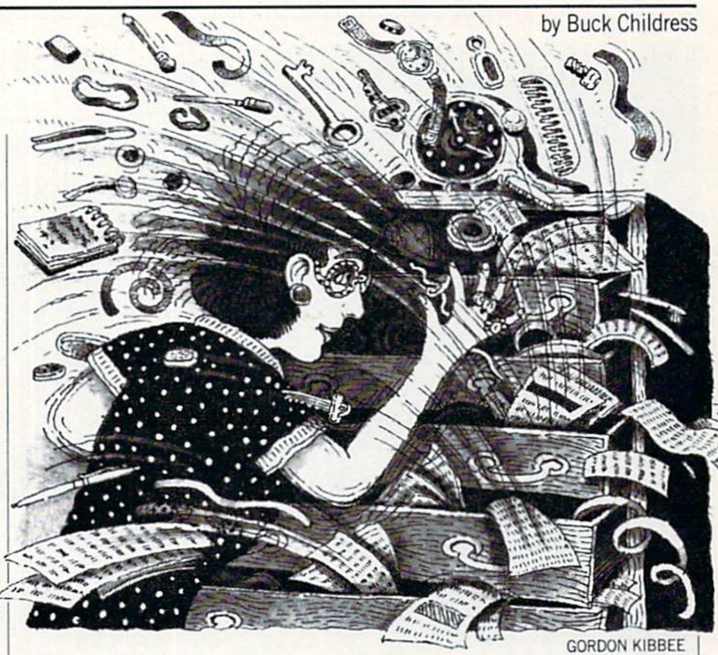
Throwing it all away: Remember that dragging icons into the Trashcan is not the last step in throwing away files. The Trashcan icon really represents a drawer on your Workbench disk. When you put things into the Trashcan, you are simply moving them to the trashcan drawer. Try moving a couple of icons to the Trashcan and then double-click on the Trashcan icon. You'll see a window open with the icons in it. To actually delete the files or programs in the trashcan you must select the Empty Trash item in the Disk menu. Once you do this, the files are destroyed, and the disk will reclaim the space.

Lisa Siracusa
Commodore ■

by Buck Childress

List Patrol

For the Commodore 64


GORDON KIBBEE

It begins innocently enough. Today you're going to tighten up that latest gem you've been programming. You'll tidy up the list a bit, maybe even change a few things. Heck, it'll be running like a Swiss watch in no time. So, with ambition at its peak, you grab a cup of hot coffee and head for the computer. But after spending hours pouring over your program listing in search of this variable and that routine, your ambition has been reduced to a big headache. Sound familiar? If you're tired of leaving the computer room feeling as though you've gone fifteen rounds with Muhammed Ali, call on List Patrol.

List Patrol quickly finds anything you're looking for, from graphics and punctuation, to variables and keywords (PRINT, AND, OR, etc.). Each line containing your chosen target will be listed just as it appears in the program (the entire line, not just the line number). You can easily make changes, then continue listing, all with the press of a key. List Patrol is simple to use. Here's how.

After saving a copy of List Patrol, run it. The BASIC loader will poke the Machine Language data into memory and automatically activate List Patrol. To use List Patrol, just press any one of the function keys. The screen will clear and a prompt will appear asking what you want to locate. You can enter anything, up to 30 characters in length. List Patrol remains in the quote mode while you answer. This allows you to enter any character(s) you want, including cursor control, function key, and other normally non-printing characters. If you make a mistake, press the INST/DEL key. When you're ready, press RETURN.

List Patrol will list up to eight target lines at a time. After the last line a bar will appear with the message:

F1=FOR * F3=REV * F5=BEGINNING * F7=REDO

If you press F1, and are not at the end of the list, List Patrol will continue forward. Should a row of asterisks (*) appear, it means there are no more lines containing the target. Pressing F3 will list in reverse. If you want to immediately return to the beginning of the list, press F5. This is especially useful with long lists. F7 allows you to start all over.

You can exit List Patrol at any time by pressing the RUN-/STOP key. Press any one of the function keys to reenter List Patrol. If you're in the quote, insert, or reverse mode, List Patrol

Quickly find any string, variable or keyword in your program listings.

waits for the mode to be exited. This lets you program the function keys or use them for graphics without having to disable List Patrol first.

Here's a couple of tips that will make List Patrol easy to use. Since it will find virtually anything you want, graphics, punctuation, letters, numbers, keywords, etc., you may want to be fairly precise when answering the prompt. For example, if you want to find the variable A and you answer the prompt with A, every line containing an A will be listed. If you answer with A= or =A, as the case may be, you'll really narrow it down. Don't abbreviate keywords. Just enter them as they appear in the list. If you see something you want to change while using List Patrol, press the RUN/STOP key. Make your correction and press any function key to continue. It's as quick and easy as that.

Because List Patrol resides in an area away from BASIC RAM, you can load and save programs without disturbing it. If for some reason you need to disable List Patrol (a good idea if you plan to run your program), press the RUN/STOP-RESTORE combination. SYS 50000 will reenable it.

Try List Patrol. It's easy to use and gets the job done fast. ■

Before typing this program, read "How to Enter Programs" and "How to Use the Magazine Entry Program." The BASIC programs in this magazine are available on disk from Loadstar, P.O. Box 30007, Shreveport, LA 71130-0007, 1-800-831-2694.

List Patrol

```
5 PRINT CHR$(147)"LOADING AND
  CHECKING DATA LINE:":J=50000:L=50
  :C=11'FUBS
10 PRINT CHR$(19)TAB(31)L:PRINT'EJFB
15 FOR B=0 TO C:READ A:IF A<0 OR
   A>255 THEN 25'JOTK
20 POKE J+B,A:X=X+A:NEXT B:READ A
   :IF X=A THEN 30'JRSH
25 PRINT"ERROR IN DATA LINE:"L
   :END'CCVJ
30 X=0:J=J+12:L=L+5:IF L<386 THEN
   10'ISAI
35 PRINT"THE DATA IS OK AND LOADED..."
   :PRINT'CBOM
40 PRINT"LIST PATROL IS NOW ACTIVE..."
   :PRINT'CBGI
45 PRINT"PRESS ANY FUNCTION KEY TO
   USE...":SYS 50000:END'DHJQ
50 DATA 173,20,3,174,21,3,224,195,240,
   18,141,192,1404'BUMK
55 DATA 198,142,193,198,169,109,162,
   195,120,141,20,3,1650'BYHQ
60 DATA 142,21,3,88,96,165,199,208,18,
   165,212,208,1525'BVUL
65 DATA 14,165,216,208,10,165,203,201,
   3,144,4,201,1534'BVAQ
```

```
70 DATA 7,144,3,108,192,198,173,192,
   198,174,193,198,1780'BXPM
75 DATA 120,141,20,3,142,21,3,88,32,
   223,197,133,1123'BTHQ
80 DATA 251,162,1,160,14,24,32,240,
   255,169,0,162,1470'BUJN
85 DATA 208,134,204,157,0,198,232,208,
   250,32,37,198,1858'BXQS
90 DATA 169,111,166,251,157,168,4,173,
   134,2,157,168,1660'BXQO
95 DATA 216,32,240,197,32,228,255,240,
   248,201,3,240,2132'BXNT
100 DATA 244,133,212,201,13,240,51,
    201,20,208,27,166,1716'BXAE
105 DATA 251,240,230,32,210,255,173,
    33,208,157,168,216,2173'BANK
110 DATA 169,0,202,157,208,198,198,
    251,206,243,198,76,2106'BYTG
115 DATA 176,195,166,251,224,30,176,
    201,32,210,255,157,2073'BAUL
120 DATA 208,198,230,251,238,243,198,
    76,176,195,32,223,2268'BAAH
125 DATA 197,169,3,162,8,133,253,134,
    254,141,240,198,1892'BXVL
130 DATA 142,241,198,169,0,141,248,
    198,141,249,198,141,2066'BARI
135 DATA 250,198,169,13,32,210,255,32,
    216,197,32,216,1820'BXDM
140 DATA 197,169,208,162,0,160,198,
    133,251,132,252,142,2004'BARJ
145 DATA 242,198,142,244,198,142,245,
    198,142,247,198,161,2357'BCDO
150 DATA 253,240,3,76,102,197,32,240,
    197,32,226,197,1795'BWSJ
155 DATA 170,32,216,197,32,216,197,
    161,253,208,21,169,1872'BYKP
160 DATA 13,32,210,255,169,42,162,39,
    32,210,255,202,1621'BWKK
165 DATA 16,250,238,247,198,76,254,
    196,32,216,197,165,2085'BYFQ
170 DATA 253,166,254,141,240,198,142,
    241,198,76,35,196,2140'BAMM
175 DATA 173,242,198,205,243,198,208,
    165,173,250,198,208,2461'BCUR
180 DATA 15,238,250,198,173,240,198,
    174,241,198,141,0,2066'BYLN
185 DATA 199,142,1,199,32,226,197,168,
    238,244,198,174,2018'BYGS
190 DATA 240,198,173,241,198,134,253,
    133,254,177,253,170,2424'BCJO
195 DATA 200,177,253,32,205,189,169,
    32,32,210,255,32,1786'BXHS
200 DATA 216,197,32,216,197,162,0,161,
    253,240,9,32,1715'BVEF
205 DATA 102,197,32,216,197,76,189,
    196,169,13,32,210,1629'BXBK
210 DATA 255,238,246,198,173,246,198,
    201,8,176,35,173,2147'BYDH
215 DATA 251,198,240,27,169,0,141,251,
    198,174,249,198,2096'BYAM
220 DATA 238,249,198,238,249,198,173,
    240,198,157,2,199,2339'BAAI
225 DATA 232,173,241,198,157,2,199,76,
    70,196,169,0,1713'BVCM
230 DATA 141,246,198,162,35,189,49,
    198,240,7,32,210,1707'BWWI
235 DATA 255,232,76,5,197,32,240,197,
    165,203,201,3,1806'BVGN
240 DATA 208,3,76,148,195,201,6,208,8,
    173,248,198,1672'BUDJ
245 DATA 240,235,76,2,196,201,4,208,
    14,174,247,198,1795'BVUO
250 DATA 208,223,141,251,198,238,248,
    198,76,70,196,201,2248'BAVL
255 DATA 5,208,210,173,248,198,240,
    205,206,248,198,206,2345'BAIQ
260 DATA 249,198,174,249,198,206,249,
    198,189,0,199,141,2250'BASM
265 DATA 241,198,202,189,0,199,141,
    240,198,173,243,198,2222'BAOR
270 DATA 141,242,198,76,124,196,16,42,
    166,212,208,38,1659'BXXM
275 DATA 56,233,127,170,160,255,140,
    245,198,202,240,8,2034'BYWR
280 DATA 200,185,158,160,16,250,48,
    245,200,185,158,160,1965'BAEO
285 DATA 48,6,32,146,197,76,128,197,
    56,233,128,238,1485'BVOS
290 DATA 245,198,174,244,198,240,3,76,
    210,255,201,34,2078'BXPO
295 DATA 208,12,72,173,252,198,73,1,
    141,252,198,133,1713'BWHT
300 DATA 212,104,162,0,193,251,240,10,
    173,245,198,240,2028'BYKG
305 DATA 2,104,104,76,38,196,230,251,
    238,242,198,161,1840'BXHL
310 DATA 251,208,10,173,245,198,240,2,
    104,104,76,124,1735'BXUH
315 DATA 196,173,245,198,208,12,32,
    216,197,76,63,196,1812'BXHM
320 DATA 230,253,208,2,230,254,96,32,
    68,229,169,0,1771'BUKI
325 DATA 133,198,133,199,133,212,133,
    216,141,252,198,96,2044'BBHO
330 DATA 165,203,201,63,208,249,104,
    104,32,226,197,32,1784'BYBJ
335 DATA 225,255,240,251,166,211,240,
    8,169,20,32,210,2027'BXKO
340 DATA 255,202,208,250,162,24,32,37,
    198,32,80,195,1675'BWMK
345 DATA 169,2,133,198,169,65,162,20,
    141,119,2,142,1322'BVBP
350 DATA 120,2,108,192,198,189,49,198,
    240,197,32,210,1735'BXWL
355 DATA 255,232,76,37,198,18,76,73,
    83,84,32,80,1244'BSMP
360 DATA 65,84,82,79,76,13,13,13,76,
    79,67,65,712'BOSL
365 DATA 84,69,63,32,0,82,69,65,68,89,
    46,32,699'BNGQ
370 DATA 32,32,13,0,13,18,70,49,61,70,
    79,82,519'BNQL
375 DATA 32,42,32,70,51,61,82,69,86,
    32,42,32,631'BOIR
380 DATA 70,53,61,66,69,71,73,78,78,
    73,78,71,841'BOYN
385 DATA 32,42,32,70,55,61,82,69,68,
    79,13,0,603'BNWR
```

END

by Elizabeth Deal

Math Helper For Parents

Here's a little routine to calculate greatest common factors.

This little math routine is for the parents of teenagers. Given any two integers, it finds their greatest common factor, known in some math books as GCF. The program was written on the B128 but will run on any CBM computer.

So, next time your child asks "what's the GCF of 1221 and 2553" you'll be ready with "111" in a jiffy. No more trying to figure out what the textbook says, no more following some incomprehensible examples in the textbook —you don't even have to understand what this is all about. Just put the numbers your child tells you into variables A and B, and seconds later you've got the answer. The order of A and B doesn't matter, but in the above example one calculating step would have been saved if variable A contained the larger of the two numbers.

Screen output looks like this:

euclid's greatest common
factor finder ... liz deal

A	B	RATIO	REMAINDER
1221	2553	0	1221
2553	1221	2	111
1221	111	11	0

GCF= 111
A/GCF= 11
B/GCF= 23

Keep this program locked up. Kids do have to learn how to do it the hard way. It's good for their character I suppose. But you don't have to learn this if you don't need to use it daily. In case anyone feels like accusing me of preaching ignorance ... well, I suppose it's ignorance to a certain extent. But since I haven't needed to find out the GCF of such huge numbers in the last 20 years or more, I cannot see any reason to memorize the mechanics now. Just enough to get by in my homework monitoring task.

Before typing this program, read "How to Enter Programs" and "How to Use the Magazine Entry Program." The BASIC programs in this magazine are available on disk from Loadstar, P.O. Box 30007, Shreveport, LA 71130-0007, 1-800-831-2694.

Math Helper

```
100 PRINT"EUCLID'S GREATEST
    COMMON"'BAUC
110 PRINT"FACTOR FINDER ... LIZ
    DEAL"'BACD
120 A=1221:B=2553:VA=A:VB=B'ETNE
130 PRINT" A"," B","RATIO",
    "REMAINDER"'BDGE
140 RA=INT(A/B)'DGWC
150 R=A-RA*B:PRINT A,B,RA,R'EOWG
160 IF R>0 THEN A=B:B=R:GOTO 140'GLNH
170 PRINT"[SPACE3]GCF="B'BBAE
180 PRINT" A/GCF="VA/B'CDSG
190 PRINT" B/GCF="VB/B'CDUH
200 END'BACV
```

END

Continued from pg. 26

through the ball, sending it soaring toward its destination. Depending upon when the fire button is pushed, overswings, flubs, hooks and slices are all possible deviations from your planned shot. My experience has found that practiced players can execute their shot exactly as they had intended about 75% of the time, which would seem to be a fairly realistic accuracy rate for most experienced golfers.

With all the game's essentials firmly in place, Electronic Arts rounds off their contest with some valuable extras. Your computerized caddy will be happy to produce an updated scorecard whenever you wish, listing each hole's yardage, par and difficulty, along with each player's strokes and handicap. Every time the game is approached, conditions such as green dampness, pin placement and wind strength are randomized, to insure a fresh challenge with each round. For those of you looking to hone your golf skills before putting in a full eighteen holes, there's a practice mode that not only includes a driving range and putting green, but also permits you to visit any hole on any course to help you familiarize yourself with actual playing conditions.

And when you've finally mastered all the courses in this package and you're out scouting for some new challenges, Electronic Arts allows you to be your own worst enemy by including a full-scale Golf Course Construction Set on disk. That's right, *World Tour* also lets you build your own dream course. Every inch of terrain from tee to pin is put under your creative control, with every conceivable building block at your disposal. All the essential constituents, like bunkers, trees and grass are included, along with the more subtle elements, like background skylines, 150 yard markers, and green inclines. Whether you're recreating your favorite nearby pitch-and-putt or tailoring one of the major professional courses to suit your specifications, you'll find this construction set complete and easy to use.

Electronic Arts, the software publisher with some of the highest standards in the industry, has once again measured up successfully. If you own a 64 and would like to play a round, *World Tour Golf* just might be the perfect partner.

The Hole Truth

The quickest way to get familiar with your new set of *World Tour* clubs is to get out there and use them. Pick a course, grab hold of your joystick and whack away. Practice makes perfect, and with the help of the step by step instructional guide found in Electronic Arts' outstanding player's manual, you're sure to get the swing of things in no time. For additional assistance, you might want to look over the tips I've listed below.

The straight path is not always the most advisable. Many course obstacles are so positioned that the only way to avoid trouble is to steer around them. Golfers can greatly increase their chances for a winning round by learning how to put an intentional curve on the ball. This is a difficult technique to master, and you'll probably go through a few buckets at the driving range before you can get a manageable draw or fade. But it will be time well invested, for you will then be able to avoid hazards without missing the fairway. Just remember to keep a careful eye on wind conditions, lest you find yourself blown way off course.

Once your ball lands on the green and the perspective switches to the overhead view of the putting surface, you will not be able to knock your ball back off of the green no matter how hard you hit it. Use this element to your advantage whenever you're faced with a long putt to a pin positioned at the far edge of the green. Try to hit the ball so that it will stop a foot or two beyond the cup. This will assure that you don't fall short with your stroke. And in the event that you underestimate your strength and send the ball sailing, it will roll to a quick halt as soon as it nears the fringe, leaving you with a short tap-in to finish the hole.

Once you've tried a few different attribute settings for your surrogate and have settled on a combination with which you are comfortable, be sure to stick with it. All of your practice shots and playing strategies can be greatly effected if you suddenly start changing your character's strengths and tendencies, much like a bowler being thrown off his usual game by trying to use balls of varying weights.

Those touchy approach shots from right around the green can be very difficult to execute with your short irons. The design of the swing meter—which calls for three quick pushes on the firebutton—makes it next to impossible to accurately place a short wedge chip shot with any kind of consistency. If your lie is fair to perfect and you're within 35 yards of the green, try to make the shot with your putter. You'll have more control of your club, resulting in more precise, better positioned clips. ■

Continued from pg. 34

ed of my pre-architecture classes in the late 60's. Each day I spent hours visualizing and drawing pieces of machinery in triple views, front, top and side, exactly the way this package creates the three views of an object. My instructor would also have me create a three-dimensional drawing to illustrate how the object would appear if viewed 45 degrees to the left and above. *Perspectives II* would be perfect for such studies, especially since it allows the student to alter the viewing angle so easily. The same power may be useful for art students or artists as well. It goes without explanation why I think engineering, drafting and architecture students will find *Perspectives II* a program after their own heart. Programmers and animators could benefit from *Perspectives II's* Film Studio option. With it they could create unique and realistic three-dimensional graphics or animations for display. One section of the manual explains how to easily add displays created with *Perspectives II* to your own programs (Via both BASIC and Machine Language). There are also several sample graphics stored on the program disk which serve as a tutorial.

Objects created with *Perspectives II* can contain up to 191 different points and 100 lines. The Film Studio reserves an area for "film strips" which can contain a maximum of 122 frames. (Of course, the more complex the object, the fewer frames the film strip can hold.)

The 108 page manual is not for the faint of heart. The program is for serious use and the manual reflects that seriousness. The text is precise and clear if you are familiar with the terminology used, but if you are not, I suggest you approach it with your Merriam-Webster dictionary in one hand and a computer dictionary in the other.

In conclusion, *Perspectives II* requires patience to master, but will do amazing feats once you know how to handle it. However, if you just want to doodle on your screen, this is not the program for you. *Perspectives II* is much too demanding and complicated for casual sketching. This is a program to work with, not kill time with.

If you've ever marveled at a computer demonstration which showed futuristic automobiles and airplanes, formed by contour lines, which could be rotated on the screen to display each curve and twist of the craft's outline — you're going to be intrigued with *Perspectives II*. ■

Adventure Road

Continued from pg. 40

action games are built into the role-playing system. Electronic Arts' long-awaited *Wastelands* may not materialize until November or even March of 1988. Strategic Simulations' Amiga versions of *Roadwar 2000* and *Phantasie* are available for those who seek role-playing action in either the far future or a medieval fantasy world.

Clues

Hitchhiker's Guide is far from new, but QuestBusters still gets mail from people continually stuck on the Babel Fish puzzle. You need the satchel, gown, towel and junk mail from the porch. Hang gown on hook, put towel on drain, put satchel in front of robot panel and put mail on satchel. Press button. Get all but mail. Flip switch for clue on how to get the atomic vector plotter.

In the more recent *Bureaucracy*, most people have trouble getting cash from the bank. To do so, get a withdrawal slip. Fill it out and enter $75 for the amount. Go to the deposit window and give it and the negative cheque (from the fortified house) to the teller. (To enter the house, you need a password from the weirdo in the farmhouse, which requires paying close attention to the message you hear at the intercom.) This puts $75 into your account, which you can withdraw and use to pay the cabbie.

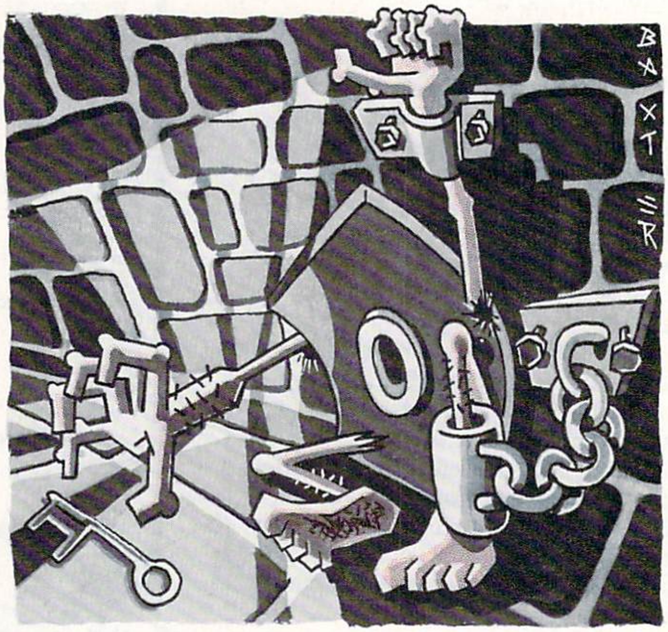
Thieves in *Phantasie III* begin with more powerful bows than other classes, so create five extra thieves and give their bows to your real party. You can enter the room in the southwest of the giant's dungeon if you have the Key of Light. Push the c2 button on the machine in Chronos' castle to reach the Plane of Darkness.

Moebius makes it very frustrating to rescue the priests in the Realm of Fire. One way is to walk on water to the small island of the good priests that lies southeast of the main island. Use a stop spell and ask one to follow you, then go to the gate and save. Take the shortest route back to statue island by moving 2-S, 1-SW, 1-S, 8-SW, 1W to statue. If priest made it, save the game. If not, restart and try again. When he does go 5-SW, 9-W to the entrance of Fire Island. Repeat with the other priest to obtain an item needed to complete the quest. This is especially frustrating because the priests aren't very good swimmers, and all you can do is repeat the trip until they manage to survive. Sometimes it helps if you let the priest rest awhile before going into the water. C

by Herbert Swartz

Beginning of the End for Shrinkwrap Licenses

A recent federal decision has voided Louisiana's shrinkwrap license statute.



ART BAXTER

The consumer — and in this instance the consumer as software purchaser — is still champ.

That is the message that shines through in the recent federal decision voiding Louisiana's shrinkwrap-license statute. Consumers of computer software have won a major victory as well they should (see our previous discussion of the subject in Commodore Microcomputers, January/February, 1986, pages 96-97.)

Here is the scenario: A person enters a store, selects the widget, or car, or loaf of bread he wants, pays for it, and leaves *owning* the product. As American — and as legally correct — as apple pie and motherhood. Yet manufacturers have long maintained that this is not true for software. The consumer is merely a licensee; he hasn't bought the software; he has simply licensed it; he doesn't own it.

The question "why?" follows inevitably. Especially since the clerk who accepted the customer's money for the software didn't tell him he wasn't buying. Nor was there any sign on the wall to alert the customer.

Software manufacturers answer that the customer is not the owner because of the shrinkwrap license, that heavily legal document a consumer discovers when he goes home and opens the software package he paid for. The shrinkwrap license informs the consumer he has not purchased the software but merely licensed it. And if he doesn't agree to that condition, he should return to the store, give back the software package and get a refund.

In their own defense, software manufacturers cite their need to avoid the stringencies of federal copyright law. (Courts have long since declared computer programs to be copyrightable creations.) Two sections of The 1976 Copyright Act are at issue. Both describe the rights of an owner of a copyrighted work.

The first is generic: Section 109 allows "the owner...of a...copy (of a copyrighted work) ... without the authority of the copyright owner, to sell or otherwise dispose of the possession of that copy ..." It is this section, for example, that permits a consumer to buy a book, and then to sell it or give it away, notwithstanding the underlying copyright rights of the author. While the bookstore, which owns the book, might choose to rent it ("otherwise dispose") rather than sell.

Copyright law grants the copyright holder several "exclusive rights." No one can make copies, publicly display the work, or make derivative works without his permission. These rights remain constant despite section 109. However, section 109 provides an exception to the "exclusive right" of a copyright holder to distribute copies of the work.

For their part, computer software manufacturers don't want distribution of programs outside the stream of commerce they alone control. Above all, they don't want software vendors renting software. How then to avoid section 109? By declaring that the consumer, the paying consumer, is not an "owner" as section 109 requires. Transmogrify him, courtesy of the shrinkwrap license, from owner to licensee.

The second issue involves section 117, the computer-specific section of the 1976 Act. It permits "the owner" of a computer program "to make ... another copy or adaptation" so long as such is "an essential step" in "utilizing" the program or is for "archive purposes." But software manufacturers would prefer that they, and not federal law, set the boundaries for permissible use of their programs.

So the solution? The shrinkwrap license. Make everyone a licensee. Let no one be an "owner." Avoid the statutes entirely. But will the scheme work? Is the law, and federal law at that, so easily skirted?

Software manufacturers are not without funds to hire persuasive legal counsel. These lawyers have argued the case well for their clients. Many legal theorists, however, even without clients to represent, have argued the contrary. For several years, though, no answer was available. No legal case raised the many legal issues involved.

Then Louisiana got into the act. It passed a *state* statute in effect replicating the shrinkwrap license. For those paying for software in the state, the shrinkwrap license had risen from mere supposed private agreement to the force of state law. The first test of the statute occured when Vault Corporation, manufacturer of PROLOK, a computer-software security product, sued Quaid Software for violation of the Louisiana Software Enforcement Act.

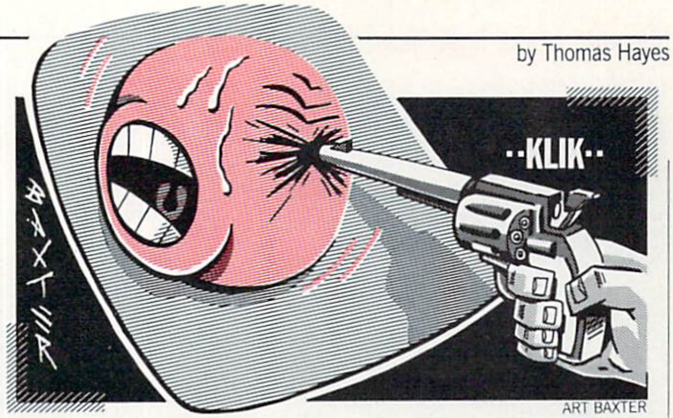
In federal court, consumers hit a home run — maybe even a grand slam. Said the court: The contract that the Vault seeks to enforce is one of "adhesion," and therefore unenforceable. Judges frown on these contracts, such as the small print on a parking ticket, a coat check, or an insurance policy, the print the consumer never reads. Courts will only enforce contracts both sides bargain for, understand, and agree upon. To the Louisiana court, the shrinkwrap license —which a consumer never bargained for, understood, or agreed to — is unenforceable.

The Louisiana statute was also overruled by "preemption." This latter legal doctrine relies on the preeminence, or superior-

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by Thomas Hayes

Spot Shot
For the Commodore 64



ART BAXTER

In Spot Shot, the object is to shoot the red circle for the maximum score

Spot Shot is not an average name for a game. Perhaps that's because Spot Shot is not an average game—this game is far from average. Other games tend to appeal to only one age group. Spot Shot was designed with all age groups in mind. To create a game that appeals to all it must be somewhat simplistic. But for all of you who find this game to be too simple, you may find the programming techniques worthwhile.

After you type in the game, save a copy to disk or cassette and run the program. Once the screen is cleared, you will see the name of the game along with a prompt to enter the time limit. The time limit will be in the range of 0001 to 9999. The four-digit number must be entered one digit at time.

Now that the time has been decided, the screen is cleared and you see the game screen. At the top of the game screen is the name of the game. The next screen line displays the time at the left and the score at the right. The screen line after that contains the score for the spot when it is hit.

All the action takes place in the lower half of the screen. At the start of the game you will notice the four spinners that are the main objects of Spot Shot. The other two components are the spot and the shooter. The spot is a brilliant red circle that moves randomly around the screen. As for the shooter, it's your means by which you shoot the spot, hence the name of the game.

The four spinners are different colors, so when the spot that is randomly moving around the screen comes into contact with one of the spinners, the spot will turn the color of the spinner. As a further indication of the color of the spot, the border color will always be the same color as the spot.

At the beginning of the game, your shooter will appear at the bottom of the screen. The shooter, with the help of the joystick plugged into port #2, can be moved around the perimeter of the screen. When the shooter is at the top or bottom of the screen, it can be moved left or right with the same movement of the joystick. If the shooter is at the right or left, it can be moved up or down with the same movement of the joystick. To move from one of the four sides to another you must first move to the connecting corner then move in the direction in which you wish to go. For example, if at the beginning of the game you wish to move to the right side, first move all the way to the right, then move the joystick up.

You have different scores for each colored spot. If you shoot the spot with your shooter when it is red, your score will increase by 25 points. If you shoot the spot when it is blue, the score increases by 100 points. Red equals 25 points, green equals 50, yellow equals 75, and blue equals 100. After your time is up, the screen clears and your score is displayed on the screen. At this time you will be asked if you wish to play again. If you do, press the spacebar and a new game will begin. C

Before typing this program, read "How to Enter Programs" and "How to Use the Magazine Entry Program." The BASIC programs in this magazine are available on disk from Loadstar, P.O. Box 30007, Shreveport, LA 71130-0007, 1-800-831-2694.

Spot Shot

```
10 PRINT"[CLEAR,GREEN]";:POKE 53280,2
   :POKE 53281,0'DRFC
20 PRINT"[RVS,SPACE40]";'BBED
21 PRINT"[RVS,SPACE4,SHFT Q4,SPACE4,
   SHFT Q5,SPACE5,SHFT Q4,SPACE4,
   SHFT Q6,SPACE4]";'BBCS
22 PRINT"[RVS,SPACE3,SHFT Q2,SPACE2,
   SHFT Q2,SPACE3,SHFT Q2,SPACE2,
   SHFT Q2,SPACE3,SHFT Q2,SPACE2,
   SHFT Q2,SPACE5,SHFT Q2,SPACE6]";
   'BBLP
23 PRINT"[RVS,SPACE3,SHFT Q2,SPACE7,
   SHFT Q2,SPACE2,SHFT Q2,SPACE3,
   SHFT Q2,SPACE2,SHFT Q2,SPACE5,
   SHFT Q2,SPACE6]";'BBLP
24 PRINT"[RVS,SPACE4,SHFT Q4,SPACE4,
   SHFT Q5,SPACE4,SHFT Q2,SPACE2,
   SHFT Q2,SPACE5,SHFT Q2,SPACE6]";
   'BBIS
25 PRINT"[RVS,SPACE7,SHFT Q2,SPACE3,
   SHFT Q2,SPACE7,SHFT Q2,SPACE2,
   SHFT Q2,SPACE5,SHFT Q2,SPACE6]";
   'BBRP
26 PRINT"[RVS,SPACE3,SHFT Q2,SPACE2,
   SHFT Q2,SPACE3,SHFT Q2,SPACE7,
   SHFT Q2,SPACE2,SHFT Q2,SPACE5,
   SHFT Q2,SPACE6]";'BBLS
27 PRINT"[RVS,SPACE4,SHFT Q4,SPACE4,
   SHFT Q2,SPACE8,SHFT Q4,SPACE6,
   SHFT Q2,SPACE6]";'BBLT
28 PRINT"[RVS,SPACE40]";'BBEL
30 PRINT"[RVS] [RVOFF,SPACE38,RVS] ";
   'BBNF
31 PRINT"[RVS] [RVOFF,SPACE3,SHFT Q4,
   SPACE4,SHFT Q2,SPACE2,SHFT Q2,
   SPACE4,SHFT Q4,SPACE4,SHFT Q6,
   SPACE3,RVS] ";'BBPT
32 PRINT"[RVS] [RVOFF,SPACE2,SHFT Q2,
   SPACE2,SHFT Q2,SPACE3,SHFT Q2,
   SPACE2,SHFT Q2,SPACE3,SHFT Q2,
   SPACE2,SHFT Q2,SPACE5,SHFT Q2,
   SPACE5,RVS] ";'BBUR
33 PRINT"[RVS] [RVOFF,SPACE2,SHFT Q2,
   SPACE7,SHFT Q2,SPACE2,SHFT Q2,
   SPACE3,SHFT Q2,SPACE2,SHFT Q2,
   SPACE5,SHFT Q2,SPACE5,RVS] ";'BBBQ
34 PRINT"[RVS] [RVOFF,SPACE3,SHFT Q4,
   SPACE4,SHFT Q6,SPACE3,SHFT Q2,
   SPACE2,SHFT Q2,SPACE5,SHFT Q2,
```

```
    SPACE5,RVS] ";'BBUU
35 PRINT"[RVS] [RVOFF,SPACE6,SHFT Q2,
    SPACE3,SHFT Q2,SPACE2,SHFT Q2,
    SPACE3,SHFT Q2,SPACE2,SHFT Q2,
    SPACE5,SHFT Q2,SPACE5,RVS] ";'BBBS
36 PRINT"[RVS] [RVOFF,SPACE2,SHFT Q2,
    SPACE2,SHFT Q2,SPACE3,SHFT Q2,
    SPACE2,SHFT Q2,SPACE3,SHFT Q2,
    SPACE2,SHFT Q2,SPACE5,SHFT Q2,
    SPACE5,RVS] ";'BBUV
37 PRINT"[RVS] [RVOFF,SPACE3,SHFT Q4,
    SPACE4,SHFT Q2,SPACE2,SHFT Q2,
    SPACE4,SHFT Q4,SPACE6,SHFT Q2,
    SPACE5,RVS] ";'BBUW
38 PRINT"[RVS] [RVOFF,SPACE38,RVS] ";
    'BBNN
39 PRINT"[RVS,SPACE40,RVOFF]";'BBUO
40 D$="ENTER NUMBER OF "
    :E$=" FIRST DIGIT":G$="SECOND
    DIGIT"'DITO
41 H$=" THIRD DIGIT":J$=" FORTH DIGIT"
    :K$="[HOME,DOWN19]"'DIGM
42 L$="[YELLOW]PLEASE ENTER THE TIME
    LIMIT IN THE RANGE OF [RVS]
     (0001 TO 9999) [RVOFF]"'BCPT
44 PRINT K$;L$:PRINT"[WHITE]";D$;E$;
    'CNNI
45 GET I$:Z=ASC(I$+CHR$(0))
    :IF Z>57 OR Z<48 THEN 45'KUMQ
46 Z=Z-48:'CFHI
47 PRINT Z;"[LEFT]";'BDHJ
50 PRINT K$;"[DOWN2]";D$;G$;'BKHD
51 GET I$:Y=ASC(I$+CHR$(0))
    :IF Y>57 OR Y<48 THEN 51'KUGN
52 Z=Z*10+(Y-48)'EJVH
53 PRINT Z;"[LEFT]";'BDHG
54 PRINT K$;"[DOWN2]";D$;H$;'BKIH
55 GET I$:Y=ASC(I$+CHR$(0))
    :IF Y>57 OR Y<48 THEN 55'KUKR
56 Z=Z*10+(Y-48)'EJVL
57 PRINT Z;"[LEFT]";'BDHK
60 PRINT K$;"[DOWN2]";D$;J$;'BKKE
61 GET I$:Y=ASC(I$+CHR$(0))
    :IF Y>57 OR Y<48 THEN 61'KUHO
62 Z=Z*10+(Y-48):I=Z'FMIK
63 PRINT I;"[LEFT]";'BDUG
65 IF I<1 THEN PRINT"[GREEN]";
    :GOTO 40'FGTL
100 PRINT"[CLEAR]";:FOR C=55296 TO
     56295:POKE C,2:NEXT C'GTQD
102 UU=0:POKE 53280,2:POKE 53281,
     15'DUJD
105 N=PEEK(53278):NN=PEEK(53279)'ESRG
110 TP$="[HOME,DOWN,RIGHT24,BLACK,RVS]
     "'BDXA
120 T$="[HOME,DOWN,RVS,BLACK]TIME=
     [SPACE7,LEFT7]":S$="SCORE="'CFGI
130 F$="[HOME,RIGHT16]SPOT SHOT"'BCUD
140 C$="[HOME,DOWN2]BLUE=100[SPACE2]
     YELLOW=75[SPACE2]GREEN=50[SPACE2]
     RED=25"'BCHJ
400 FOR G=0 TO 2:PRINT"[RVS,BLACK,
     SPACE40]";:NEXT G'FHBI
410 PRINT F$;T$;UU;TP$;S$;UU;C$'BVOE
490 PRINT"[HOME,DOWN3,RED,RVS,SPACE40,
     BLUE]";:QQ=2'CFNP
500 B=2024:T=1183:L=INT(RND(1)*(839)
     +1184)'HCRJ
502 C=81:V=53248:S=54272:GOSUB 900
     :W=1'FYNJ
505 POKE 49695,0:POKE 49700,192
     :SYS 49693'DXKK
510 FOR M=I TO 0 STEP-1
     :X=INT(RND(1)*(4)+1)'KPFJ
520 IF X=1 THEN IF(L+1)<B THEN POKE
     L+1,C:POKE L,32:L=L+1
     :GOTO 710'NYKO
530 IF X=2 THEN IF(L-1)>T THEN POKE
     L-1,C:POKE L,32:L=L-1
     :GOTO 710'NYFP
540 IF X=3 THEN IF(L+40)<B THEN POKE
     L+40,C:POKE L,32:L=L+40
     :GOTO 710'NCJR
550 IF X=4 THEN IF(L-40)>T THEN POKE
     L-40,C:POKE L,32:L=L-40
     :GOTO 710'NCES
590 GOTO 710'BDHJ
600 PRINT"[CLEAR]":POKE 49695,49
     :POKE 49700,234:SYS 49693
     :POKE V+21,0'GGJK
610 FOR A=S TO S+24:POKE A,0
     :NEXT A'GLGH
620 PRINT"[DOWN2,RIGHT6]
     YOUR SCORE IS ";UU:'BEOI
630 PRINT"[RIGHT6,CMDR Y13]"'BAIN
640 PRINT"[DOWN4,RIGHT6]
     PRESS SPACE BAR TO PLAY AGAIN
     ?"'BATN
650 GET HA$:IF HA$=""THEN 650'EKEJ
660 IF HA$=" "THEN RESTORE:CLR
     :GOTO 10'GHEL
670 END'BACH
700 REM'BARB
710 IF W=1 THEN POKE P,190
     :POKE P+1,190:POKE P+2,190
     :POKE P+3,190:W=2:GOTO 750'MKDR
720 IF W=2 THEN POKE P,191
     :POKE P+1,191:POKE P+2,191
     :POKE P+3,191:W=3:GOTO 750'MKJS
730 IF W=3 THEN POKE P,192
     :POKE P+1,192:POKE P+2,192
     :POKE P+3,192:W=4:GOTO 750'MKPT
740 IF W=4 THEN POKE P,193
     :POKE P+1,193:POKE P+2,193
     :POKE P+3,193:W=1:GOTO 750'MKRU
750 IF AB=1 THEN POKE S+11,17:AB=0
     :GOTO 757'HRNO
755 POKE S+11,16:AB=1'DKPP
757 IF PEEK(1020)>0 THEN POKE S+4,33
     :GOTO 760'HQMU
758 POKE S+4,32'CFNQ
760 IF PEEK(2) > 0 THEN POKE 2,0
     :POKE L,32:GOTO 765'HQSO
761 PR=PEEK(787)'CHNL
762 IF PR>0 THEN:POKE 782,PR:SYS 49706
     :POKE 787,0:POKE 53280,PR
     :QQ=PR'ILWW
763 GOTO 795'BDUL
765 IF QQ=6 THEN UU=UU+100'FKCR
```

```
766 IF QQ=7 THEN UU=UU+75'FJQS
767 IF QQ=5 THEN UU=UU+50'FJHT
768 IF QQ=2 THEN UU=UU+25'FJGU
770 PRINT TP$;S$;UU;'BKAL
790 L=INT(RND(1)*(839)+1184)'FPOQ
795 PRINT T$;M;:NEXT M:GOTO 600'DLDT
900 REM ** PUT SPRITE DATA IN MEMORY
    **'BATK
905 FOR A=12288 TO 12350:READ D
    :POKE A,D:NEXT A'GTFP
910 FOR A=12352 TO 12414:READ D
    :POKE A,D:NEXT A'GTXL
915 FOR A=12416 TO 12478:READ D
    :POKE A,D:NEXT A'GTJQ
920 FOR A=12480 TO 12542:READ D
    :POKE A,D:NEXT A'GTCM
925 FOR A=12544 TO 12606:READ D
    :POKE A,D:NEXT A'GTER
930 FOR A=12608 TO 12670:READ D
    :POKE A,D:NEXT A'GTGN
935 FOR A=12672 TO 12734:READ D
    :POKE A,D:NEXT A'GTIS
940 FOR A=12160 TO 12222:READ D
    :POKE A,D:NEXT A'GTRO
945 FOR A=12224 TO 12286:READ D
    :POKE A,D:NEXT A'GTDT
950 FOR A=49152 TO 49744:READ D
    :POKE A,D:NEXT A'GTWP
960 FOR A=S TO S+24:POKE A,0:NEXT A
    :POKE S+24,15'ISER
965 POKE S,250:POKE S+1,3:POKE S+4,32
    :POKE S+6,240:POKE S+7,55
    :POKE S+8,39'LKGD
970 POKE S+13,128'CHPM
975 P=2040:POKE P,192:POKE P+1,193
    :POKE P+2,192:POKE P+3,193
    :POKE P+7,198'KOJE
976 POKE P+4,194:POKE V+39,6
    :POKE V+40,7:POKE V+41,5
    :POKE V+42,2:POKE V+46,1'MLMG
977 POKE V+28,16:POKE V+37,1
    :POKE V+38,2'GSWY
978 POKE V,75:POKE V+1,110
    :POKE V+2,245:POKE V+3,110
    :POKE V+4,75:POKE V+5,185'LNLI
979 POKE V+6,245:POKE V+7,185
    :POKE V+8,170:POKE V+9,229
    :POKE V+21,31'KJBH
980 POKE V+29,15:POKE V+23,15'ENQQ
990 RETURN'BAQM
1000 REM  ********    3
     ********'BRWV
1010 DATA 0,0,14,0,0,28,0,0,56,0,0,
     112'BDFY
1020 DATA 0,0,224,0,1,192,0,3,128,0,7,
     0'BEPA
1030 DATA 0,14,0,0,28,0,0,56,0,0,112,
     0'BDFB
1040 DATA 0,224,0,1,192,0,3,128,0,7,0,
     0'BEPC
1050 DATA 14,0,0,28,0,0,56,0,0,112,0,
     0'BDFD
1060 DATA 224,0,0'BHKA
1100 REM  ********    4
     ********'BRXW
1110 DATA 0,24,0,0,24,0,0,24,0,0,24,
     0'BCBA
1120 DATA 0,24,0,0,24,0,0,24,0,0,24,
     0'BCBB
1130 DATA 0,24,0,0,24,0,0,24,0,0,24,
     0'BCBC
1140 DATA 0,24,0,0,24,0,0,24,0,0,24,
     0'BCBD
1150 DATA 0,24,0,0,24,0,0,24,0,0,24,
     0'BCBE
1160 DATA 0,24,0'BGKB
1200 REM  ********* BOTTOM
     *********'BYMA
1210 DATA 0,0,0,0,0,0,0,0,0,0,0,0,0,
     0'BELB
1220 DATA 0,0,0,0,0,0,0,0,0,0,0,0,0,
     0'BELC
1230 DATA 0,0,0,0,0,0,0,0,0,0,0'BXQC
1240 DATA 15,0,0,15,0,0,15,0,0,31,64,
     0'BDHE
1250 DATA 31,64,0,85,80,0,85,80,0'BXJE
1300 REM  ********** TOP
     ***********'BYSA
1310 DATA 0,0,0,0,0,0,0,0,0,0,0,0,0,
     0'BELC
1320 DATA 0,0,0,0,0,0,0,0,0,0,0,0,0,
     0'BELD
1330 DATA 0,0,0,85,80,0,85'BQPC
1340 DATA 80,0,31,64,0,31,64,0,15,0,
     0'BCXF
1350 DATA 15,0,0,15,0,0,0,0,0,0,
     0'BATG
1360 DATA 0,0,0'BFGD
1400 REM  ********** LEFT
     **********'BYCC
1410 DATA 0,0,0,0,0,0,0,0,0,0,0,0,0,
     0'BELD
1420 DATA 0,0,0,0,0,0,0,0,0,0,0,0,0,
     0'BELE
1430 DATA 0,0,0,80,0,0,84,0,0,85,0,
     0'BBMF
1440 DATA 85,0,0,95,240,0,95,240,0,
     85'BCBG
1450 DATA 0,0,85,0,0,84,0,0,80,0,
     0'BYBG
1500 REM  ********* RIGHT
     **********'BYRD
1510 DATA 0,0,0,0,0,0,0,0,0,0,0,0,0,
     0'BELE
1520 DATA 0,0,0,0,0,0,0,0,0,0,0,0,0,
     0'BELF
1530 DATA 0,0,0,0,80,0,1,80,0,5,80,0,
     5'BDGG
1540 DATA 80,0,255,80,0,255,80,0,5,80,
     0'BEII
1550 DATA 5,80,0,1,80,0,0,80,0'BUOH
1600 REM  ********** SHOT
     **********'BYVE
1610 DATA 0,0,0,0,0,0,0,0,0,0,0,0,0,
     0'BELF
1620 DATA 0,0,0,0,0,0,0,0,0,0,0,0,0,
     0'BELG
1630 DATA 0,0,0,0,0,0,0,0,0,0,0,0,0,
     0'BELH
```

```
1640 DATA 14,0,0,14,0,0,0,0,0,0,0,0,0,
     0'BEAI
1650 DATA 0,0,0,0'BHXF
1700 REM  **********  1
     **********'BVIE
1710 DATA 224,0,0,112,0,0,56,0,0,28,0,
     0'BEGG
1720 DATA 14,0,0,7,0,0,3,128,0,1,192,
     0'BDOH
1730 DATA 0,224,0,0,112,0,0,56,0,0,28,
     0'BEGI
1740 DATA 0,14,0,0,7,0,0,3,128,0,1,
     192'BDOJ
1750 DATA 0,0,224,0,0,112,0,0,56,0,0,
     28'BEGK
1760 DATA 0,0,14'BGJH
1800 REM  **********  2
     **********'BVJF
1810 DATA 0,0,0,0,0,0,0,0,0,0,0,0,0,
     0'BELH
1820 DATA 0,0,0,0,0,0,0,0,0,0,0,0,0,
     0'BELI
1830 DATA 255,255,255,255,255,255'BXHJ
1840 DATA 0,0,0,0,0,0,0,0,0,0,0,0,0,
     0'BELK
1850 DATA 0,0,0,0,0,0,0,0,0,0,0'BXQK
2000 REM ******  M.L.  DATA
     ***********'BADY
2001 DATA 173,0,220,41,31,73,31'BVDY
2002 DATA 168,240,31,74,144,31,
     169'BYSB
2003 DATA 196,174,8,208,224,24,
     240'BYTC
2004 DATA 13,173,16,208,41,16,240'BXLC
2005 DATA 12,224,77,208,8,169,197'BXHE
2006 DATA 141,252,7,206,9,208,76'BWAE
2007 DATA 154,192,74,144,31,169,
     196'BAEG
2008 DATA 174,8,208,224,24,240,13'BXPG
2009 DATA 173,16,208,41,16,240,12'BXKH
2010 DATA 224,77,208,8,169,197,
     141'BYHA
2011 DATA 252,7,238,9,208,76,154'BWJA
2012 DATA 192,74,144,39,169,195,
     174'BANC
2013 DATA 9,208,224,71,240,6,224'BWSC
2014 DATA 229,208,23,169,194,141,
     252'BBWE
2015 DATA 7,206,8,208,173,8,208'BVCE
2016 DATA 201,255,208,8,173,16,
     208'BYOG
2017 DATA 41,239,141,16,208,76,
     154'BYSH
2018 DATA 192,74,144,31,169,195,
     174'BAFI
2019 DATA 9,208,224,71,240,6,224'BWSI
2020 DATA 229,208,18,169,194,141,
     252'BBBB
2021 DATA 7,238,8,208,208,8,173'BVHB
2022 DATA 16,208,9,16,141,16,208'BWTC
2023 DATA 152,41,16,240,71,173,21'BXJD
2024 DATA 208,41,128,208,64,173,
     16'BYRF
2025 DATA 208,41,16,240,7,169,144'BXVF
2026 DATA 141,16,208,208,3,141,16'BXKG
2027 DATA 208,173,8,208,141,14,
     208'BYNI
2028 DATA 173,9,208,141,15,208,
     173'BYQJ
2029 DATA 21,208,9,128,141,21,208'BXNJ
2030 DATA 173,252,7,201,194,208,2'BXRB
2031 DATA 133,251,201,195,208,2,
     133'BADD
2032 DATA 252,201,197,208,2,133,
     253'BAJE
2033 DATA 201,196,208,2,133,254,
     173'BALF
2034 DATA 9,208,201,230,144,3,206'BXIF
2035 DATA 9,208,201,71,176,3,238'BWXG
2036 DATA 9,208,172,8,208,173,16'BWDH
2037 DATA 208,41,16,240,9,192,78'BWCI
2038 DATA 144,12,206,8,208,208,7'BWSJ
2039 DATA 192,24,176,3,238,8,208'BWEK
2040 DATA 173,31,208,41,143,240,
     66'BYJD
2041 DATA 10,144,24,162,1,134,2'BVBD
2042 DATA 168,173,21,208,41,127,
     141'BALF
2043 DATA 21,208,169,0,133,251,
     133'BYEG
2044 DATA 252,133,253,133,254,152,
     201'BCCH
2045 DATA 2,208,4,160,6,208,22'BUKH
2046 DATA 201,4,208,4,160,7,208'BVKI
2047 DATA 14,201,8,208,4,160,5'BUJJ
2048 DATA 208,6,201,16,208,5,160'BWLK
2049 DATA 2,140,19,3,173,31,208'BVKL
2050 DATA 173,31,208,173,30,208,
     41'BYHE
2051 DATA 15,240,24,173,21,208,41'BXIE
2052 DATA 127,141,21,208,169,0,
     133'BYFG
2053 DATA 251,133,252,133,253,133,
     254'BCGH
2054 DATA 173,30,208,173,30,208,
     165'BALI
2055 DATA 251,240,24,206,15,208,
     174'BAHJ
2056 DATA 15,208,224,72,208,26,
     173'BYPK
2057 DATA 21,208,41,127,141,21,
     208'BYAL
2058 DATA 169,0,133,251,240,114,
     165'BAGM
2059 DATA 252,240,24,238,15,208,
     174'BANN
2060 DATA 15,208,224,228,208,100,
     173'BBHF
2061 DATA 21,208,41,127,141,21,
     208'BYAG
2062 DATA 169,0,133,252,240,86,
     165'BYRH
2063 DATA 253,240,40,206,14,208,
     208'BAEI
2064 DATA 8,173,16,208,41,127,141'BXSI
2065 DATA 16,208,173,16,208,10,
     176'BYNK
2066 DATA 63,173,14,208,201,25,
     208'BYIL
```

```
2067 DATA 56,173,21,208,41,127,
     141'BYJM
2068 DATA 21,208,169,0,133,253,
     240'BYFN
2069 DATA 42,165,254,240,38,238,
     14'BYRO
2070 DATA 208,208,8,173,16,208,9'BWDF
2071 DATA 128,141,16,208,173,16,
     208'BANH
2072 DATA 10,144,19,173,14,208,
     201'BYCI
2073 DATA 76,208,12,173,21,208,41'BXQI
2074 DATA 127,141,21,208,169,0,
     133'BYFK
2075 DATA 254,173,21,208,41,128,
     208'BAML
2076 DATA 7,169,0,141,252,3,240'BVML
2077 DATA 5,169,1,141,252,3,76'BUUM
2078 DATA 49,234,120,169,49,141,
     20'BYPO
2079 DATA 3,169,234,141,21,3,88'BVVO
2080 DATA 96,140,120,216,238,43,
     194'BARH
2081 DATA 208,3,238,44,194,173,44'BXDH
2082 DATA 194,201,219,208,238,173,
     43'BBTJ
2083 DATA 194,201,232,208,231,169,
     216'BCMK
2084 DATA 141,44,194,169,120,141,
     43'BALL
2085 DATA 194,96,234,234,234,234,
     234'BBXM
```

END

Continued from pg. 84

ity, of Congress to legislate on certain matters. For example, only Congress, and not an individual state, can declare war. When Congress passed the 1976 Act it expressly declared that it wanted one copyright face for the nation; that therefore all preexisting state copyright statutes were voided. The present Louisiana statute, said the court, attempts to alter parts of the 1976 Act. Preemption prevents any such alteration.

As a matter of legal technicality, the court failed to resolve one problem. Naturally, parties can contract for software as licensor-licensee; this is done all the time in the instance of minis and mainframes. But here, in the instance of software for personal computers, the court failed to declare flatly that the paying party is an "owner" rather than a licensee, and therefore subject to the benefits of sections 109 and 117. Software manufacturers may still have a thin reed to wave. But to what avail?

When Louisiana passed its statute, similar bills were pending in a host of states. Software manufacturers were doing their lobbying homework, positioning themselves behind the banner of piracy, which everyone can abhor. Yet only Illinois followed Louisiana's lead, and pressure to pass shrinkwrap acts has all but abated.

Just as well. No doubt the next legal case will wrap up loose ends. A court will declare unequivocally that purchasing software, at least as people now pay for it in computer stores, provides for passage of title, and that the paying party is "the owner."

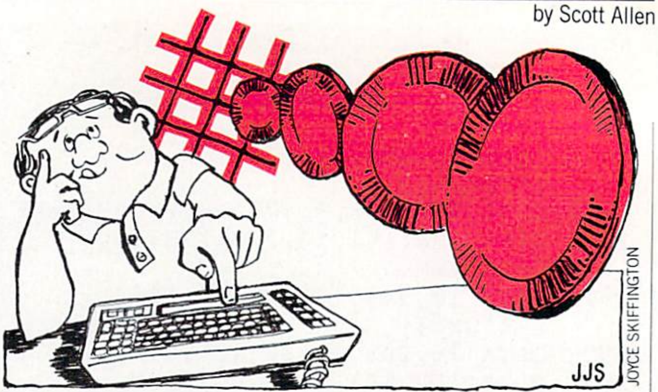
That done, case closed. Sections 109 and 117 apply. And once again, the consumer will have triumphed. If you pay for software, with nothing else said at the time of the transaction, *you own it.* C

by Scott Allen

Join Four

For the Commodore 64

Here is a computer version of join four, a popular board game. The object is simple — join four of your pieces before your opponent does. Your pieces can be joined in a horizontal, vertical or diagonal row. Just type in the program and run it. The program will instruct you from there. C



JOYCE SKIFFINGTON

Before typing this program, read "How to Enter Programs" and "How to Use the Magazine Entry Program." The BASIC programs in this magazine are available on disk from Loadstar, P.O. Box 30007, Shreveport, LA 71130-0007, 1-800-831-2694.

Join Four

```
5 VV=54296:WW=54276:AA=54277:HF=54273
  :LF=54272:SS=54278:PH=54275
  :PL=54274'INEX
20 INPUT"[CLEAR]ENTER 1ST PLAYER";
   PL$(1):IF LEN(PL$(1))<1 THEN
   20'FTPK
30 INPUT"[HOME,DOWN]ENTER 2ND PLAYER";
   PL$(2):IF LEN(PL$(2))<1 THEN
   30'FTQK
35 TR=0:TU=1:PL(1)=81:PL(2)=87
   :PT(1)=81:PT(2)=254:CQ=1'HTVT
40 PRINT"[CLEAR]";:PRINT"[WHITE]";
   :POKE 53281,0:POKE 53280,0'ETRG
50 PRINT"[HOME,PURPLE,SPACE14,RVS]
   JOIN FOUR[RVOFF]"'BAPH
60 PRINT"[SPACE18]BY"'BARF
70 PRINT"[SPACE9]KENNETH SCOTT
   ALLEN"'BAQK
75 PRINT"[SPACE9,RVS]FOUR IN A ROW IS
   A WIN[RVS]"'BAGP
80 PRINT"[DOWN,RIGHT11]1[RIGHT]2
   [RIGHT]3[RIGHT]4[RIGHT]5[RIGHT]6
   [RIGHT]7"'BAKI
90 PRINT"[RIGHT10,CMDR A,SHFT *,
   CMDR R,SHFT *,CMDR R,SHFT *,CMDR R,
   SHFT *,CMDR R,SHFT *,CMDR R,SHFT *,
   CMDR R,SHFT *,CMDR S]"'BAWR
100 FOR X=1 TO 6'DDYW
110 PRINT"[RIGHT10,SHFT -,SHFT SPACE,
    SHFT -,SHFT SPACE,SHFT -,
    SHFT SPACE,SHFT -,SHFT SPACE,
    SHFT -,SHFT SPACE,SHFT -,
    SHFT SPACE,SHFT -] [SHFT -]"'BATI
120 PRINT"[RIGHT10,CMDR Q,SHFT *,
    SHFT +,SHFT *,SHFT +,SHFT *,
    SHFT +,SHFT *,SHFT +,SHFT *,
    SHFT +,SHFT *,SHFT +,SHFT *,
    CMDR W]"'BAMK
130 NEXT X'BBRX
140 PRINT"[UP,RIGHT10,CMDR Z,SHFT *,
    CMDR E,SHFT *,CMDR E,SHFT *,
    CMDR E,SHFT *,CMDR E,SHFT *,
    CMDR E,SHFT *,CMDR E,SHFT *,
    CMDR X]"'BASM
150 DATA 1315,1317,1319,1321,1323,
    1325,1327'BJXH
160 DATA 1395,1397,1399,1401,1403,
    1405,1407'BJRI
170 DATA 1475,1477,1479,1481,1483,
    1485,1487'BJVJ
180 DATA 1555,1557,1559,1561,1563,
    1565,1567'BJOK
190 DATA 1635,1637,1639,1641,1643,
    1645,1647'BJHL
200 DATA 1715,1717,1719,1721,1723,
    1725,1727'BJAD
210 FOR X=1 TO 6:FOR Y=1 TO 7
    :READ A(X,Y):NEXT:NEXT'JQQG
220 CQ=CQ+1:PRINT CO$(TU);"[HOME,
    DOWN19]ENTER MOVE PLAYER";TU'DRAK
224 IF A$<>"" THEN POKE 198,0'FHSG
225 GET A$:MO=VAL(A$):IF MO>7 OR MO<1
    THEN 224'ITRM
230 CO=MO:IF PEEK(A(1,MO))<>96 AND
    PEEK(A(1,MO))<>32 THEN 220'KFCM
240 FOR L=1 TO 6'DDMC
250 POKE A(L,MO),PL(TU)
    :POKE A(L,MO)+54272,PT(TU)'DJMK
260 IF L>1 THEN POKE A(L-1,MO),96'FNUI
270 IF PEEK(A(L+1,MO))<>96 AND
    PEEK(A(L+1,MO))<>32 THEN PO=L:L=7
    :CR=MO:GOSUB 350'POTW
280 NEXT L'BBFE
290 IF TR=41 THEN 330'DHHI
300 TR=TR+1'CFQY
310 IF TU=1 THEN TU=2:GOTO 220'FKLD
320 IF TU=2 THEN TU=1:GOTO 220'FKLE
330 PRINT"[CLEAR]":PRINT"BOARD IS
    FULL":GOTO 660'DFYG
350 F1=0:FOR PR=PO TO PO+3
    :IF PEEK(A(PR,MO))<>PL(TU) THEN
    PR=PO+3:F1=1'NMAU
```

```
360 NEXT:IF F1<>1 THEN GOTO 650'GHEI
380 PQ=0:PT=CR:F1=0:FOR PR=PO TO PO-3
    STEP-1:PQ=PQ+1'LCBT
390 IF PEEK(A(PR,PT+(PQ-1)))<>PL(TU)
    THEN PR=PO-3:F1=1'KFGU
400 NEXT:IF F1<>1 THEN GOTO 650'GHED
420 PW=0:F1=0:PT=CR:FOR PR=PO TO PO+3
    :PW=PW+1'JBKN
430 IF PT-(PW-1)>0 THEN
    PZ=PT-(PW-1)'IRFK
440 IF PEEK(A(PR,PZ))<>PL(TU) THEN
    PR=PO+3:F1=1'IAWN
450 NEXT:IF F1<>1 THEN GOTO 650'GHEI
460 IF PW+PQ=7 THEN 650'EIRI
470 REM RIGHT'BFNH
480 PW=0:PQ=0:F1=0:FOR PT=MO TO MO+3
    :IF PEEK(A(PO,PT))<>PL(TU)THEN
    PT=MO+3:F1=1'PUCC
490 PQ=PQ+1:NEXT:IF F1<>1 THEN GOTO
    650'INNP
510 F1=0:FOR PT=MO TO MO-3 STEP-1
    :IF PEEK(A(PO,PT))<>PL(TU) THEN
    PT=MO-3:F1=1'PNJT
520 PW=PW+1:NEXT:IF F1<>1 THEN GOTO
    650'INAJ
530 IF PW+PQ=7 THEN 650'EIRG
540 REM RIGHT DOWN'BJSG
550 PQ=0:PT=CR:F1=0:FOR PR=PO TO PO+3
    :PQ=PQ+1'JBSR
560 IF PEEK(A(PR,PT+(PQ-1)))<>PL(TU)
    THEN PR=PO+4:PT=MO+3:F1=1'MLPW
570 NEXT:IF F1<>1 THEN GOTO 650'GHEL
590 PW=0:PT=CR:F1=0:FOR PR=PO TO PO-3
    STEP-1:PW=PW+1'LCTW
600 IF PT-(PW-1)>0 THEN
    PZ=PT-(PW-1)'IRFJ
610 IF PEEK(A(PR,PZ))<>PL(TU) THEN
    PR=PO-3:F1=1'IAXM
620 NEXT:IF F1<>1 THEN GOTO 650'GHEH
630 IF PW+PQ=7 THEN 650'EIRH
640 RETURN'BAQE
650 GOSUB 800:PRINT PL$(TU)" WON"'CLAJ
660 PRINT"DO YOU WANT TO PLAY AGAIN
    (Y/N)"'BAFO
670 GET YE$:IF YE$="" THEN 670'EKXL
680 IF YE$="Y" THEN RESTORE
    :GOTO 700'FHEM
683 IF YE$="N" THEN 690'DGWO
685 GOTO 660'BDLO
690 END'BACJ
700 PRINT"[CLEAR]ARE THESE THE SAME
    PLAYERS (Y/N)"'BAJK
701 GET ANS$:IF ANS$="" THEN 701'EMXH
710 IF ANS$="Y" THEN 35'DGVF
730 IF ANS$="N" THEN 20'DGEH
740 GOTO 701'BDHG
800 POKE VV,15:POKE AA,88: POKE PH,15
    :POKE PL,15:POKE SS,89
    :FOR EE=1 TO 6'IJLO
805 POKE HF,31:POKE LF,164
    :POKE WW,65'DSTM
810 FOR T=1 TO 150:NEXT:POKE WW,64
    :NEXT EE:RETURN'HQIK
```

END

by Mark Jordan

The 128 Mode:
Big League Baseball

Explore the Commodore 128 in its powerful native mode. Some of the articles in this column may be technical, some not so technical — but we guarantee that they will spark your creativity.

Ever since owning a computer I have had a yearning to create a baseball game based on Major League statistics. As a kid I spent hours playing strategy-type baseball dice/board games. I thrilled at the thought of managing the Pittsburgh Pirates to pennants they never acquired in real life. Never mind that I still had those same .220 hitters to deal with (except, of course, for the great Roberto Clemente), I could do what all the Pirate managers of the 60's could not — win.

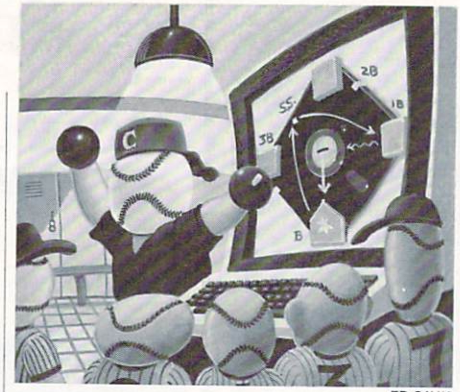
Or so I thought. Unfortunately, the games my friends and I played were statistically accurate. Two-twenty hitters stayed .220 hitters, pitchers with bloated ERAs continued to let runs score unabated. But sometimes my tactics did make a difference. And it was this chance, this hope, that made me love strategy baseball games.

And so, I present to you Big League Baseball, my memento to my youth, to baseball, and to the Commodore 128. Now as creator of a strategy baseball game based on real life Major Leaguers, I can be assured of managing my Bucs to the World Series . . . if not by tactics, then by outright cheating (Tis the right of the creator to control his creation).

And so I present to you Big League Baseball, the computerized, enhanceable, statistically-accurate, tactically-exhilerating, low maintenance, graphically-appealing, easy-to-use, fun, free project for this month's "The 128 Mode".

You may be wondering just what a strategy baseball game is like. When you get right down to it, there are only three main aspects to a strategy baseball game: 1) creating teams, 2) playing games, and 3) keeping track of the results.

To do a really bang-up job of all three requires a program too long to list in a single issue of a magazine. Thus, Big League Baseball comes to you in two installments. This issue we will be able to perform points one and two above; we'll be able to create our leagues and we'll be able to play games. Next issue we'll add the routines necessary to keep full statistics on our league as well as add some bells and whistles to the game-play part.



ED SAUK

Big League Baseball is not a reflex, twitch, zing-pow-zoom game. It is more cerebral.

I must warn you: you've got some typing to do. After you've finished typing in the listing (which is long enough), you're still not finished. For one thing, you must next type in the rosters and statistics of the teams you want in your league. While that is not a major task (it took me about a half-hour to type in the six teams in the National League East), it must be done or you simply won't have any teams to manage. Then there's the fact that this is only part one of a two-part program. Next month you'll have more typing. But think of the freedom you'll have: You can create any teams you can get the statistics for. You could have a league of all the great Yankee teams. That might be a pretty big league. On the other hand you could create a much more manageable-sized league of the great Pittsburgh Pirates teams. The choice is completely yours.

And, as you'll see in the next issue, you will be able to fine-tune your program so that it is rock-hard true to life. So what are you waiting for — get typing.

Getting Started

The first time you RUN the program, you'll have a lengthy wait with nothing to look at. The reason for the blackout is that the VIC chip has been shut off (thanks to the FAST command in line 10) to speed things up while the screen is drawn. You will then notice that your disk drive will operate. Don't be alarmed. What's happening is the screen, after being drawn, is saved to disk with the filename 'baseball'. From this point on, whenever you RUN the program you'll only have to wait a few seconds.

The first thing you'll discover is a menu with four options: Play, Create, Update, or Quit. Since this is our maiden voyage we have but one choice — Create. It's a very intuitive process but let's look at it briefly anyway.

Creating the Team Files

Press C for create. You're transported to a menu listing all 26 Major League teams. Use your cursor to select whatever team you wish to create and press Return.

Right now you're probably wondering - where are the data and the stats that you must type in? The answer is - in your Sunday newspaper or a USA Today. Or better yet, in a baseball yearbook which contains the complete statistics from last year. The statistics you will need are as follows:

For the hitters, you must obtain the number of at-bats, hits, homeruns, walks, and you must determine a speed factor from 0 - 9 (explanation below).

For pitchers you will need innings pitched, hits allowed, walks, strikeouts, and games. ERA you may be surprised to discover, is not needed.

Inputing the stats is as simple as following the prompts. The only subjective choice you must make concerns player speed. A good baseball yearbook (try Bill James' *Great American Baseball Stat Book* or his *Baseball Abstract*) can help you make a determination. I simply glance at a player's stolen base/caught stealing ratio and make a guess. If in doubt, I give him a 5 . . . unless he's a catcher in which case a 1 would be a gift.

Let me say a word about the statistics. The game could have been made to be extremely statistically accurate — the programming needed to do that would not be difficult at all. But I felt that it might be difficult for users to get hold of all those statistics so I tried to incorporate stats that are readily available. for example, I used the homerun stat coupled with at-bats to get a power rating which is then used to determine not only homeruns, but also doubles and triples.

This isn't as tidy or accurate as it would have been had I included doubles and triples stats, but those statistics are harder to find. Next month we'll look at ways you

can alter the program to include more player data.

You can create rosters of up to 24 players. You can quit at any time. Of course, you could, if you wanted, put all the good players on one team — your team. Or you could inflate your players' statistics. This is your right. It is called cheating. The choice is yours.

Playing the Game

Once you have created two teams or more, you're ready to play. Choose the Play option from the main menu and again select from the 26-team menu the two teams you wish to play. You'll then be transported to the lineup card menu. You can shuffle through your roster using the N (for next player) and V (for previous player) keys, decide what players you want where in the batting order, and place them by pressing Return.

Please note: this first installment doesn't allow any juggling of players, so be sure you have the right man in the right spot in the batting order before you press Return. Next installment we'll add the ability to manipulate the lineup as much as we like.

You can, if you wish, play eight outfielders, just as you could in real life. The only lineup limitation is that you must have at least one pitcher in the lineup. You will not be allowed to play nine regulars. You American League fans will be able to use a DH. Just follow the prompts.

Once both lineups are set, you'll be brought back to the ballpark — a generic one. This first installment is not "park sensitive", But next time, Wrigley Field games will have more home runs while the Astrodome will continue to be a pitcher's delight.

At this point let me say a few harsh words to arcade gamers: Big League Baseball is not a reflex, twitch, zing-pow-zoom game. It is more cerebral. Take heart, however. There is a little zing-pow-zoom involved and there will be more available as an option in the second installment. The reflex part is this. When you press a key, the pitcher pitches. You must press again for the batter to bat. If you fail to press while the ball is within 5 pixels of your batter, a strikeout is recorded. It isn't hard to press within that 5-pixel limit but you must know what is the bull's eye of that range. It is the center of the batter's body. As long as the ball is touching his body, you'll be ok.

You can, quite easily, adjust this range. Just change the 5 in line 2390 to whatever, and it's done.

After each swing something happens. Either the batter gets a hit or he doesn't. You must watch the screen to see the result.

Please don't be disappointed with the sprites in this first installment. To keep the listing at a reasonable length, some compromises had to be made. Again, next month's installment will add the eye-catching features that make a game fun to watch as well as play. Be patient.

I hope your appetite is whetted. the game is fun to play and it is enhanceable. If you're a programmer, with just a little study, you can modify it to do amazing things. Next month we'll examine how it works in more detail. For now, let's get our leagues set up and spring training started. As rookie managers we'll need a month to get the feel of things.

But next month, look out.

Big League Baseball Features

Features that are in the present version:

— Ability to easily enter, save, and modify teams
— Ability to play statistically accurate games
— Players hit for average and power just as often as they would in real life.
— Pitchers get the same number of strikeouts they would in real life, they tire as in real life, they even bat poorly as in real life.
— On-screen viewing of hitter's stats
— Ability to set lineups any-which-way
— Attractive bit-mapped, perspective field
— Menu-driven, easy-to-follow format

Features coming next month:

— Ability to record your stats
— Ability to print out sorted stats with department leaders
— Ability to make managerial moves at any time - including steals, bunts, infield in, hit and run, etc.
— Statistically accurate ballparks
— Animated sprites running the bases, catching the flyballs
— Full game play with arcade response option
— Sound effects and music ■

Before typing this program, read "How to Enter Programs" and "How to Use the Magazine Entry Program." The BASIC programs in this magazine are available on disk from Loadstar, P.O. Box 30007, Shreveport, LA 71130-0007, 1-800-831-2694.

Big League Baseball

```
10 FAST:PRINT CHR$(14)"[CLEAR]"
   :R1=RND(1)'FMDD
20 COLOR 0,1:COLOR 4,1:COLOR 1,6
   :GRAPHIC 1,1'EPCE
30 CHAR 1,0,0,".":SSHAPE A$,3,5,26,25
   :SPRSAV A$,6'DAMG
40 CHAR 1,10,1,"[SHFT Q]"
   :CHAR 1,10,2," ",1:CHAR 1,10,3,"
   [SHFT B]",1:SSHAPE A$,72,5,95,25
   :SPRSAV A$,1:SCNCLR'GXAQ
50 FOR T=1 TO 5:SPRSAV 1,T:READ X,Y
   :MOVSPR T,X,Y:NEXT'HUHK
60 DATA 156,189, 202,132, 86,136, 28,
   192, 110,168'BMGJ
70 TRAP 80:BLOAD"[UP ARROW]
   BALLPARK"'CEFI
80 IF DS>0 THEN DCLEAR:ELSE 150'FIWJ
90 DRAW 1,319,45 TO 260,16 TO 163,
   16 TO 24,163 TO 290,163 TO 319,
   128'GPPQ
100 CIRCLE 1,145,160,35,16,97,350
    :DRAW 1,+0,+0 TO+27,116 TO 100,
    116'HQRH
110 CIRCLE 1,84,104,30,16,138
    :DRAW 1,+0,+0 TO+120,+0'HECG
120 CIRCLE 1,196,104,30,16,,120
    :DRAW 1,+0,+0 TO 175,168'FIVH
130 PAINT 1,245,60:PAINT 1,50,150'CRGD
140 BSAVE"[UP ARROW]BALLPARK",B0,
    P8192 TO P16383'CQOG
150 TRAP:COLOR 1,2:CHAR 1,3,20,"
    [CMDR O]",1'DOCG
160 CHAR 1,17,20,"[CMDR I]",1'BKTE
170 CHAR 1,24,13,"[CMDR I]",1'BKTF
180 CHAR 1,10,13,"[CMDR I]",1'BKOG
190 E$=CHR$(27):EM$=E$+"M":EL$=E$+"L"
    :LC$=CHR$(14):J$=E$+"J"
    :ET$=E$+"T"'MMHV
200 SP$="[SPACE40]"'BDUC
210 CD$="[HOME,DOWN25]"'BDZA
220 CU$="[UP,DOWN,LEFT,RIGHT]
    "+CHR$(13)'DHQC
```

```
230 DIM TM$(4,7),HO$(1,25,6),HO(1,25,
    6),PL(1,10),RE$(14),IN$(1,6)'BHKL
240 FOR T=0 TO 14:READ RE$(T)
    :NEXT'FMGF
250 DATA "[SHFT L]INEOUT","[SHFT F]
    LYOUT","[SHFT F]LYOUT","[SHFT G]
    ROUNDOUT","[SHFT G]ROUNDOUT","
    [SHFT P]OPOUT","[SHFT F]LYOUT","
    [SHFT S]TRIKEOUT","[SHFT S]
    INGLE"'BIIC
255 DATA "[SHFT D]OUBLE","[SHFT T]
    RIPLE","[SHFT H]OMERUN","[SHFT W]
    ALK","[SHFT E]RROR","[SHFT D]
    OUBLEPLAY"'BFPV
260 FOR ME=1 TO 1:FOR T=0 TO 10
    :READ M$(ME,T):NEXT:NEXT'JUFL
270 DATA "[SPACE2,SHFT S]ELECT[SPACE2]
    ","[SHFT P]=PLAY[SPACE4]","
    [SHFT C]=CREATE[SPACE2]","[SHFT U]
    =UPDATE[SPACE2]","[SHFT Q]=QUIT
    [SPACE4]",,,,,,"PCUQ"'BKVU
280 FOR I=1 TO 4:FOR T=1 TO 7
    :READ TM$(I,T):NEXT:NEXT'JSFN
290 DATA "[SHFT C]ARDINALS","[SHFT C]
    UBS","[SHFT E]XPOS","[SHFT M]ETS",
    "[SHFT P]IRATES","[SHFT P]
    HILLIES","[SPACE6]"'BGDV
300 DATA "[SHFT A]STROS","[SHFT B]
    RAVES","[SHFT D]ODGERS","[SHFT G]
    IANTS","[SHFT P]ADRES","[SHFT R]
    EDS","[SPACE6]"'BGYM
310 DATA "[SHFT B]LUEJAYS","[SHFT B]
    REWERS","[SHFT I]NDIANS","[SHFT O]
    RIOLES","[SHFT R]EDSOX","[SHFT T]
    IGERS","[SHFT Y]ANKEES"'BGMR
320 DATA "[SHFT A]NGELS","[SHFT A]
    THLETICS","[SHFT M]ARINERS","
    [SHFT R]ANGERS","[SHFT R]OYALS","
    [SHFT T]WINS","[SHFT W]
    HITESOX"'BGSS
330 FOR T=0 TO 1:FOR S=0 TO 6
    :READ IN$(T,S):NEXT:NEXT
    :IN$(1,0)=IN$(0,0):IN$(1,1)=IN$(0,
    1)'LCTR
340 DATA "[SHFT L]ASTNAME","[SHFT P]
    OSITION[SPACE2]","[SHFT A]T-BATS",
    "[SHFT H]ITS","[SHFT H]OMERUNS","
    [SHFT W]ALKS","[SHFT S]PEED
    [SPACE2]0 (SLOW) - 9 (FAST)"'BGRY
350 DATA ,,"[SHFT I]NNINGS","[SHFT H]
    ITS","[SHFT W]ALKS","[SHFT S]
    TRIKEOUTS","[SHFT G]AMES"'BGGP
360 FOR T=1 TO 7:READ PO$(T),P$(T)
    :NEXT'FRNJ
370 DATA "[SHFT P]ITCHER[SPACE3]","
    [SHFT P] ","[SHFT C]ATCHER[SPACE3]
    ","[SHFT C] ","[SHFT F]IRSTBASE ",
    "1[SHFT B]","[SHFT S]ECONDBASE",
    "2[SHFT B]","[SHFT T]HIRDBASE ",
    "3[SHFT B]","[SHFT S]HORTSTOP ","
    [SHFT S2]","[SHFT O]UTFIELD
    [SPACE2]","[SHFT O,SHFT F]"'BNBM
380 SLOW'BBKG
390 REM ----- MAIN MENU'BNBJ
400 DO'BAJX
410 ME=1:GOSUB 460'CHNB
420 ON A GOSUB 590,1670,2030,440'CSVE
430 LOOP'BAKB
440 GRAPHIC 0,1:END'CELE
450 :'ABHD
460 GRAPHIC 1:GOSUB 530
    :COLOR 1,11'DKCI
470 CHAR 1,1,1,LC$+M$(ME,0)'CREK
480 FOR T=1 TO 4:CHAR 1,1,T+2,
    LC$+M$(ME,T),1:NEXT'HAKQ
490 GET KEY A$:A=INSTR(M$(ME,10),A$)
    :IF A=0 THEN PRINT"[BELL]";
    :GOTO 490'JBPS
500 FOR T=1 TO 6:CHAR 1,1,T,"[SPACE10]
    ",1:NEXT'FNMG
510 RETURN'BAQA
520 :'ABHB
530 IF H$(0)<>""THEN 550
    :ELSE COLOR 1,15:FOR T=21 TO 24
    :CHAR 1,22,T,"[SPACE18]",1
    :NEXT'LFCR
540 COLOR 1,7:CHAR 1,22,21,LC$+"
    [SHFT S]CORE[SPACE5,SHFT R,SPACE2,
    SHFT H,SPACE2,SHFT E] ",1'DRJO
550 COLOR 1,3:FOR T=0 TO 7
    :CHAR 1,0,T,"[SPACE12]",1
    :NEXT'GRVN
560 RETURN'BAQF
570 :'ABHG
580 REM ----- PLAY'BJPJ
590 GOSUB 1230: REM PICK TEAMS'CONM
600 FOR H=0 TO 1:GOSUB 1510
    :IF H=3 THEN 840'HOQH
610 P3(H)=0:TC(H)=7+H:RU(H)=0:HI(H)=0
    :E(H)=0'GJWM
620 PRINT"[GRAY3]";:NEXT'CCSE
630 GOSUB 870:GOSUB 530'CHNF
640 GRAPHIC 1:COLOR 4,1:COLOR 1,15
    :IN=1:GV=0'FSSM
650 COLOR 1,3:CHAR 1,2,0,LC$+"[SHFT I]
    NNING"+STR$(IN)+" ",1'GTCP
660 FOR H=0 TO 1:HH=(H+1)AND 1'GLEM
670 COLOR 1,TC(HH)+8:CHAR 1,22,22,
    LC$+H$(0),1'EDTP
680 COLOR 1,TC(H)+8:CHAR 1,22,23,
    LC$+H$(1),1'ECYQ
690 FOR T=1 TO 4:SPRITE T,0,TC(H)
    :NEXT'FPAP
700 SPRITE 5,1,TC(HH):SPRITE 4,1,
    TC(H)'CWCH
710 FOR OUT=1 TO 3'DFAF
720 COLOR 1,3:CHAR 1,3,7,LC$+"[SHFT O]
    UTS"+STR$(OU-1),1'GUTN
730 DO'BAJE
740 : GOSUB 2110: REM CALCULATIONS'CS
    NK
750 : GOSUB 2240: REM PRINTBATTERSTAT
    S'CWDN
760 : GOSUB 2320:IF CH=1 THEN CH=0
    :GOTO 740'GQAO
770 : GOSUB 2340: REM PITCH'CLIL
780 IF H=1 AND IN>8 AND
    RU(1)>RU(0)THEN OU=3:EXIT'JTLT
```

```
790 LOOP UNTIL TB=0'DDUN
800 NEXT OUT'BDVD
810 IF IN>8 AND RU(1)>RU(0)THEN H=1
    :GV=1'HTVM
820 NEXT H:IF IN>8 AND
    RU(0)<>RU(1)THEN GV=1'ISDN
830 IN=IN+1:IF GV=0 THEN 650'FMOL
840 RETURN'BAQG
850 :'ABHH
860 REM ----- LINEUP'BLKL
870 GRAPHIC 0,1:COLOR 4,3
    :COLOR 0,11'DMDN
880 PRINT"[HOME2,CLEAR,BLACK,RVS]
    [SHFT N]=NEXT CARD,[SPACE2,SHFT V]
    =PREVIOUS, [SHFT R,SHFT E,SHFT T,
    SHFT U,SHFT R,SHFT N]
    =SELECT"EM$'BDBC
890 HH=0'BDNM
900 FOR H=0 TO 1:L$(H)="":P(H)=0
    :KK=1'GTTL
910 WINDOW H*20+2,2,H*20+16,DK+3'GRKL
920 PRINT"[RVS,BLUE] "LEFT$(H$(H)+SP$,
    14)ET$;'DRCL
930 FOR T=1 TO 9:PRINT"[BLACK,RVS,
    SPACE3,SHFT H]ITTER #"STR$(T)"
    [SPACE2]":NEXT:IF DK=10 THEN
    PRINT"[RVS,SPACE4,SHFT P]ITCHER
    [SPACE4]"'KNJW
940 FOR K=KK TO DK'DFUK
950 WINDOW 8,15,32,22'BLDL
960 T=0:POKE 208,1:POKE 842,78'DPIO
970 DO:GET KEY A$:IF A$=CHR$(13)THEN
    EXIT'IKQS
980 IF A$="N"THEN T1=1:GOSUB 1100'FKLQ
990 IF A$="V"THEN T1=-1
    :GOSUB 1100'GKJS
1000 LOOP'BAKS
1010 IF K<9 THEN L$(H)=L$(H)+CHR$(T)
     'GPQB
1020 PRINT"[HOME2]"LEFT$(CD$,
     K+3)TAB(H*20+2)"[RVS,RED]
     "LEFT$(HO$(H,T,0)+SP$,12)+HO$(H,
     T,1)'JQUK
1030 PL(H,K)=T'BICX
1040 IF HO$(H,T,1)="[SHFT P]
     "THEN P(H)=T'EPTD
1050 NEXT K'BBEX
1060 IF P(H)=0 THEN PRINT"[HOME2]"
     :CHAR 1,H*20+2,K+1,"[SHFT N]
     O PITCHER-REDO",1:KK=DK
     :GOTO 940'KCWQ
1070 NEXT H'BBBA
1080 RETURN'BAQB
1090 :'ABHC
1100 T=T+T1'CELV
1110 IF T<1 THEN T=NP(H)'EIQY
1120 IF T>NP(H)THEN T=1'EIOA
1130 IF INSTR(L$(H),CHR$(T))>0 THEN
     1100'FQED
1140 AV$="[SPACE9]":AV=HO(H,T,3)/HO(H,
     T,2):PH=1'EDRI
1150 IF HO$(H,T,1)<>"[SHFT P]
     "THEN AV=HO(H,T,3)/HO(H,T,2)
     :AV$="[SHFT A]VE:"+LEFT$(STR$(AV)
     +"000",5):PH=0'MVEU
1160 PRINT"[CLEAR,RVS,BLUE]
     "LEFT$(HO$(H,T,0)+SP$,
     14)AV$" "'DVNH
1170 FOR I=1 TO 5'DDID
1180 PRINT"[RVS,BLUE] [RVOFF] "IN$(PH,
     I)J$TAB(12)" - "HO$(H,T,
     I)J$TAB(24)"[RVS] "'DETL
1190 NEXT:PRINT LEFT$("[RVS]
     #"+STR$(T)+SP$,26)'GMTJ
1200 RETURN'BAQU
1210 :'ABHV
1220 REM ----- PICK TEAMS'BORB
1230 V$(1)="[WHITE] [SHFT H]OME TEAM "
     :V$(0)="[L. BLUE] [SHFT V]
     ISITORS[SPACE3]":HH=1'DPOK
1240 FOR T=1 TO 8:SPRITE T,0:NEXT'FJME
1250 GRAPHIC 2,,15:COLOR 0,1
     :COLOR 4,1'DNUF
1260 FOR H=0 TO HH:GOSUB 1290
     :F$=TM$(D,C):H$(H)=F$:DK=9
     :IF D>2 THEN DK=10'LOMQ
1270 NEXT:RETURN'CBXD
1280 :'ABHD
1290 D=1:C=2:DD=1:CC=1'ENHJ
1300 WINDOW 0,15,39,24,(H+1)AND 1'DRGB
1310 PRINT"[RVS,BLUE] [SHFT C]
     URSOR AND RETURN TO
     SELECT"V$(H)"[RVOFF,DOWN,L. BLUE]
     "EM$;'BJFJ
1320 IF H=0 THEN FOR I=1 TO 7
     :FOR T=1 TO 4:PRINT TM$(T,I),;
     :NEXT:NEXT'MWMK
1330 WINDOW 0,17,39,23:POKE 208,1
     :POKE 842,145'DACG
1340 GET KEY A$:A=INSTR(CU$,A$)
     :IF A=0 THEN PRINT"[BELL]";
     :GOTO 1340'JVVK
1350 ON A GOSUB 1410,1430,1450,
     1470'CUHG
1360 IF A=5 THEN PRINT EL$;
     :RETURN'FHUG
1370 PRINT LEFT$(CD$,CC+17)SPC((DD-1)
     *10)"[RVOFF]"TM$(DD,CC)'GDXN
1380 PRINT LEFT$(CD$,C+17)SPC((D-1)
     *10)"[RVS]"TM$(D,C)'GYGN
1390 CC=C:DD=D'CHAI
1400 GOTO 1340'BEFX
1410 C=C-1:IF C<1 THEN C=7'GIKD
1420 RETURN'BAQY
1430 C=C+1:IF C>7 THEN C=1'GIHF
1440 RETURN'BAQB
1450 D=D-1:IF D<1 THEN D=4'GILH
1460 RETURN'BAQD
1470 D=D+1:IF D>4 THEN D=1'GIIJ
1480 RETURN'BAQF
1490 :'ABHG
1500 REM ----- LOAD FILE'BNAB
1510 GRAPHIC 0'BBOA
1520 T=0:F$=H$(H)'CKTD
1530 DOPEN#2,"BB."+F$'CGJE
1540 IF DS>0 THEN PRINT"[CLEAR,BELL,
     SHFT N]OT ON DISK":SLEEP 2:H=3
     :GOTO 1630'HOAN
```

```
1550 WINDOW H*20,Ø,39,14'CMRG
1560 PRINT"[CLEAR,SHFT L]OADING [RVS]
     "F$" ":PRINT ET$;'CHNK
1570 DO:T=T+1'DEOI
1580 INPUT#2,X$:IF X$="EOF"THEN
     EXIT'FHSL
1590 HO$(H,T,Ø)=X$:PRINT"..."X$'CPHM
1600 FOR S=1 TO 6:INPUT#2,X$'EIPD
1610 HO$(H,T,S)=X$:HO(H,T,S)=VAL(X$)
     :NEXT'ECII
1620 LOOP'BAKB
1630 CLOSE 2:NP=T-1:NP(H)=T-1'FOWI
1640 RETURN'BAQD
1650 :'ABHE
1660 REM ----- CREATE'BLKI
1670 V$(Ø)="[L. BLUE] NEW TEAM.
     [SPACE2]":HH=Ø'CJLM
1680 GOSUB 1240:GRAPHIC Ø'CGFJ
1690 WINDOW Ø,Ø,39,14,1'BMQL
1700 PRINT"[RVS,SPACE4,SHFT P]
     RESS ASTERISK (*) TO[SHFT SPACE]
     SAVE DATA.[SPACE4,DOWN,RVOFF]
     "E$"T";'BDOM
1710 FOR T=1 TO 25:PH=Ø'EISF
1720 FOR S=Ø TO 6:IF UD=Ø THEN HO$(Ø,
     T,S)=""'HRYK
1730 PRINT IN$(PH,S)"[SPACE2]"HO$(Ø,T,
     S)J$TAB(LEN(IN$(PH,S)));'DJBM
1740 IF S=1 THEN BEGIN:C=Ø:PH=Ø'GKTK
1750 IF HO$(Ø,T,1)=""THEN PRINT
     PO$(1);:C=1'FURM
1760 GET KEY A$:IF A$=CHR$(13)THEN
     18ØØ'GNXM
1770 :C=C+1:IF C>7 THEN C=1'GJKN
1780 :PRINT J$TAB(10)PO$(C);'CNAM
1790 :GOTO 176Ø'BFTK
1800 :IF C>Ø THEN HO$(Ø,T,
     1)=P$(C)'ESXH
1810 :IF HO$(Ø,T,1)=P$(1)THEN
     PH=1'ETRI
1820 :BEND:PRINT:GOTO 186Ø'DIGG
1830 X$="":INPUT X$:IF X$=""THEN
     183Ø'FMGJ
1840 IF X$="*"THEN NP=T-1
     :GOTO 192Ø'GLDL
1850 HO$(Ø,T,S)=X$'BMEJ
1860 NEXT'BAEH
1870 PRINT"[RVS] [BACK ARROW] [RVOFF]
     TO RE-DO, ANY OTHER KEY TO
     CONTINUE"'BAQT
1880 GET KEY A$'CCEK
1890 PRINT"[CLEAR]";:IF A$="
     [BACK ARROW]"THEN 172Ø'EIVP
1900 NEXT'BAEC
1910 :'ABHD
1920 GRAPHIC Ø:DOPEN#2,"BB."+F$,W'DKGJ
1930 IF DS=63 THEN DCLEAR
     :SCRATCH"BB."+F$:GOTO 192Ø'HNWN
1940 PRINT"[HOME2,CLEAR;SHFT S]AVING
     [RVS] "F$" "'BCYK
1950 FOR T=1 TO NP:PRINT#2,HO$(Ø,T,
     Ø)'ERPN
1960 PRINT"..."HO$(Ø,T,Ø)'BKLL
1970 FOR S=1 TO 6:PRINT#2,HO$(Ø,T,S)
     :NEXT'FRIP
1980 NEXT:PRINT#2,"EOF"'CDRM
1990 CLOSE 2'BBJL
2000 RETURN'BAQT
2010 :'ABHU
2020 REM ----- UPDATE'BLAY
2030 UD=1:H=Ø:HH=Ø:V$(H)="[SHFT U]
     PDATE TEAM"'EQFH
2040 GOSUB 1240:H=Ø'CHIA
2050 GOSUB 151Ø:IF H=3 THEN 207Ø'ELGD
2060 GOSUB 169Ø'BERB
2070 UD=Ø:RETURN'CEQD
2080 :'ABHC
2090 RETURN: REM RECORDS'CIEG
2100 :'ABHU
2110 P=P(HH):P3(H)=P3(H)+1:PL=P3(H)
     :IF PL>9 THEN PL=1:P3(H)=1'JPCL
2120 PA=HO(HH,P,3)/(HO(HH,P,2)*3)'DAVE
2130 WP=HO(HH,P,4)/(HO(HH,P,2)*3)'DATF
2140 SP=HO(HH,P,5)/(HO(HH,P,2)*3)'DAQG
2150 TR=HO(HH,P,6)/HO(HH,P,2)'CWWG
2160 P2=PL(H,PL):IF P2=P(H)THEN BA=.1
     :WB=.Ø25:PO=.ØØ5:PO$="[SPACE3]"
     :HR$="[SPACE2]":AB$="[SPACE3]"
     :BA$=" .1ØØ":WK$="[SPACE2]"
     :GOTO 224Ø'NKVA
2170 BA=HO(H,P2,3)/HO(H,P2,2)
     :BA$=LEFT$(STR$(BA)+"ØØØ",5)
     :IF VAL(BA$)>1 THEN BA$="[SPACE3]
     "'LTBU
2180 WB=HO(H,P2,5)/HO(H,P2,2)
     :WK$=HO$(H,P2,5)'DMKN
2190 PO=HO(H,P2,4)/HO(H,P2,2)
     :PO$=MID$(STR$(PO)+"ØØØ",2,4)
     :IF VAL(PO$)>1 OR VAL(PO$)=Ø
     THEN PO$="[SPACE3]"'OCMB
2200 SB=HO(H,P2,6)'BMJY
2210 HR$=HO$(H,P2,4):AB$=HO$(H,P2,
     2)'CEVE
2220 RETURN'BAQX
2230 :'ABHY
2240 COLOR 1,11:CHAR 1,1,1,
     LC$+LEFT$(HO$(H,P2,Ø)+SP$,1Ø),
     1'FKGL
2250 CHAR 1,1,3,LC$+"[SHFT A]
     VE "+BA$+" ",1'EOBI
2260 CHAR 1,1,2,LC$+"[SHFT A,SHFT B]S
     [SPACE3]"+AB$+" ",1'EOGK
2270 CHAR 1,1,4,LC$+"[SHFT H,SHFT R]S
     [SPACE3]"+HR$+" ",1'EODL
2280 CHAR 1,1,5,LC$+"[SHFT P]
     OWER"+PO$+" ",1'EODL
2290 CHAR 1,1,6,LC$+"[SHFT W]
     ALKS "+WK$+" ",1'EOXN
2300 RETURN'BAQW
2310 :'ABHX
2320 GET KEY A$:RETURN: REM SELECT
     OPTIONS'ERXG
2330 :'ABHA
2340 SPRITE 6,1,2,Ø:MOVSPR 6,12Ø,18Ø
     :MOVSPR 6,252#6'DDTI
2350 GET A$:IF RSPPOS(6,
     Ø)<1Ø THEN 237Ø'FPII
2360 IF A$=""THEN 235Ø'DGTG
2370 T=RSPPOS(6,Ø):MOVSPR 6,Ø#Ø'DOWI
```

```
2380 SPRITE 4,Ø:SPRITE 6,Ø'CJBI
2390 TB=Ø:BI=ABS(T-4Ø):IF BI>5 THEN
     RE=7:GOTO 256Ø'JXTR
2400 X=BA:WK=WB:R1=RND(1)
     :R2=RND(1)'GUNH
2410 IF R2>.5 THEN X=PA:WK=WP'FMDF
2420 :'ABHA
2430 IF R1>X THEN BEGIN:R3=RND(1)'GKEH
2440 IF R1<X+WK THEN RE=11:TB=1
     :GOTO 254Ø'HSWK
2450 IF R3<.4 THEN RE=12:TB=1
     :GOTO 254Ø'GRJK
2460 IF R3<SP THEN RE=7:GOTO 256Ø'FMDK
2470 RE=INT(R3*6)+1'EITJ
2480 BEND:GOTO 256Ø'CGQI
2490 :'ABHH
2500 TB=1:RE=7'CHAC
2510 IF R1<PO THEN TB=4:GOTO 254Ø'FMRG
2520 IF R1<PO*2.5 THEN TB=2
     :GOTO 254Ø'GPEI
2530 IF R1<PO*3 THEN TB=3'FIVH
2540 GOSUB 263Ø:GOTO 256Ø'CJGF
2550 :'ABHE
2560 COLOR 1,15:CHAR 1,Ø,21,
     LC$+LEFT$(RE$(RE+TB)+SP$,9)'GGIQ
2570 SC$=LEFT$(STR$(RU(H))+SP$,
     3)+LEFT$(STR$(HI(H))+SP$,
     3)+LEFT$(STR$(E(H))+SP$,3)'MTCY
2580 CHAR 1,31,22+H,SC$,1'COBL
2590 SLEEP 1:CHAR 1,Ø,21,"[SPACE9]
     "'CKMM
2600 SPRITE 4,1,TC(H)'BKQC
2610 RETURN'BAQB
2620 :'ABHC
2630 R=Ø:FOR T=1 TO TB:PRINT"[BELL]";
     'FJQI
2640 IF RE=11 THEN GOSUB 278Ø
     :ON TT+1 GOTO 268Ø,267Ø,266Ø,
     265Ø'HGHO
2650 IF RSPRITE(3,Ø)=1 THEN SPRITE 3,Ø
     :R=R+1'HPYM
2660 IF RSPRITE(2,Ø)=1 THEN SPRITE 2,Ø
     :SPRITE 3,1'GQQN
2670 IF RSPRITE(1,Ø)=1 THEN SPRITE 1,Ø
     :SPRITE 2,1'GQNO
2680 SPRITE T,1:SLEEP 1:NEXT'DIEL
2690 :'ABHJ
2700 IF RE=11 THEN 276Ø'DIVE
2710 IF RE=12 THEN E(HH)=E(HH)+1
     :GOTO 276Ø'GUWK
2720 HI(H)=HI(H)+1'CLYG
2730 IF TB=1 AND RND(1)<.66 THEN
     BEGIN'HKYK
2740 IF RSPRITE(3,Ø)=1 THEN SPRITE 3,Ø
     :R=R+1'HPYM
2750 BEND:IF RSPRITE(2,
     Ø)=1 THEN SPRITE 2,Ø
     :SPRITE 3,1'HSWO
2760 RU(H)=RU(H)+R'CLUL
2770 RETURN'BAQI
2780 TT=Ø'BDMK
2790 IF RSPRITE(TT+1,Ø)=1 THEN TT=TT+1
     :GOTO 279Ø'ITNT
2800 RETURN'BAQC
```

END

Telecommunications/Inside Q-Link

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transferred to a CP/M disk using xlink or another suitable utility. Rdcbm also requires Nulu15.com and Uncr23.com (found in Crunch23.lbr) on the CP/M disk. So you'll have to transfer these as well.

Now you can boot CP/M as usual, then at the A) prompt type nulu15 rdcbm21 to run Nulu. When Nulu is loaded, enter -e *.* at the cursor to extract the files from within the rdcbm21.lbr file. When the extraction is finished, you can exit Nulu by typing -c to close the library, then -x to exit Nulu. Finally, at the A) prompt again, type in uncr23 *.* to uncrunch the files. When this is finished, you're ready to use rdcbm or examine the documentation file rdcbm.doc supplied with the program.

Rdcbm can transfer sequential or program CP/M files that have been downloaded to your formatted disk to CP/M. It can use one or two 1571 or 1541 drives, or a combination of the two. Rdcbm also can use a 1700 or 1750 RAM expansion as well. When you run Rdcbm, you have the option of assigning the source and destination disk drives. The defaults are to use drive A (device 8) for the CBM source disk and drive M (expansion RAM) for the CP/M destination.

The size of the program you can transfer is only limited by the size of your disks or expansion RAM. If you use the expansion RAM, you must use PIP.COM or NEWSWEEP.COM to transfer the files from the expansion RAM to a previously formatted CP/M disk. If you use two disk drives, you can transfer directly to the CP/M disk.

What makes Rdcbm so nice is that it uses burst loads when used with a 1571 drive. The saves to disk, however, are still at normal speeds. When used with one of the RAM expansions and a 1571, SYSOP PJ indicates you have the next best thing to a direct download to a CP/M disk.

If you have any problems or questions concerning any of these programs, or CP/M in general, drop by the Computer Connection in CIN where you can enter your question on the CP/M message board. If it's something more urgent, you can reach SYSOP PJ via E-Mail for a direct response. ■

Bob Baker is in charge of the New Products Information area on the Q-Link network. He can be reached on Q-Link via E-Mail addressed to RBAKER.

Designing A Hit

Continued from pg. 73

DK = # of defending knights
DL = defender leadership rating
RND = random number from 50 to 100

The leadership ratings are determined in other parts of the game, and are carried into the battle based on performance. The number of soldiers and knights depends on how large an army you've created for yourself, and how large the defending force is. Once a battle is joined, these two formulas are applied, repeating until one side has no men left, or it retreats. The minimum losses per battle step are 1. If the formulas return a value less than one the result is set to 1. Fractional results are ignored. You may retreat with your army at any point if you choose. The computer controlled army will stay until its losses exceed its belligerence rating, set at the beginning of the game. The results of every battle are stored and affect many of your ratings elsewhere in the game.

Remember this little exercise occurs every time you engage in a battle, and that's only a small part of the entire game. The game keeps track of hundreds of variables; your income, treasure, skill at swordplay and jousting, and an array of "hate" variables defining your relationship to the computer characters. There are algorithms that calculate the changing values of all these variables based on your actions during the game. A major part of game design revolves around "tweaking" the algorithms so that the game plays well. Play testing of beta versions helps to discover what aspects of the game need changing. By putting new values in an algorithm, a programmer can change the feel of the game, making it easier to rescue a kidnapped princess, or harder to unseat a knight during a joust.

Defender of the Crown is one of the most ambitious projects I've seen to date. In many ways it creates a very rich environment, an involving fantasy that removes you from the here and now and lets you take on a new personality, experience new sensations, and act out new roles. That's what entertainment is all about.

A lot of work goes into every computer game. Game design, art, music, programming; then of course there's the packaging, advertising, marketing and distribution, all the minor details it takes to get a finished product to you. The next time you sit down to play, take a moment to think about the work that went into the creation of the entertainment you're about to experience. ■

by Kenny Lawson

Painless Window Panes

For the Commodore 128

Create up to four window overlays at a time on your 128.

Surely, we've all seen software that uses window overlays to request input, display menus, offer help screens, or any number of other tasks. Painless Window Panes is a machine language program that will allow you to incorporate this function into your own C-128 programs. In addition, it will allow you to restore the screen under any given window, in case your application would need to return to that screen. Also included here is a demonstration program which you can use as an outline for your applications program.

I have tried to make the program as 'pain'less as possible. The window character, border colors, and the placement and displacement of the windows themselves, are all automatic. Only a SYS call from your program is necessary to place or erase the windows on the screen. However, you must format the screen output for each window overlay in your own programs.

The program will allow a total of four overlays at a time, each one offset over the last one. Of course, you don't need to use all four at once, and a simple SYS 3100 will reset the zero page pointers, so that window number one can be called up and placed first again. In this way overlays can be used any number of different times in any given program.

Painless Window Panes is an effective demonstration of the C-128's built-in Kernal routines INDSTA ($FF77) and INDFET ($FF74). These routines are used here to save each byte of the VIC screen memory, and color memory, to a protected area at the top of BANK 1 (the variable RAM), and then recall those bytes and restore them to screen and color memory. So, the first line of your own applications program must be POKE 58,223:CLR. This POKE sets aside 32 pages (8092 bytes) for the four screen and color saves, so they will not be overwritten by your string variables later. Thus, you will lose no BASIC programming memory and only 8092 bytes of variable RAM, leaving you with over 50000 bytes. (INDSTA and INDFET are on pages 454 and 455 of the *Commodore 128 Programmers' Reference Guide,* published by Bantam Books.)

Using the Program

The first thing to do is type in each program, SAVEing at least one copy of each; we all know what can happen to a program in memory if you RUN it with any errors in typing.

Although the program is written as a BASIC loader subroutine, you could if you wish, LOAD and RUN it, and then BSAVE (another nice C-128 command!) each portion to disk. Either way will work.

Next, re-LOAD the Window Loader program, and RUN it. This will install the ML routines into the RS-232 Input and Output buffers. (So, of course, if your program will be using these areas, Painless cannot be used concurrently.)

After that, LOAD the demonstration program (again, note that POKE 58,223:CLR must be the first executable line) and RUN it. This program will demonstrate the format of the window overlays, and presents one way of implementing their use.

SYS 3100 sets (or resets) some zero-page pointers that the program uses to control the colors, and placements, of the windows and borders. It also zeros out BITABL ($035E) locations, to clear the current text screen line links, which prevents corruption of the screen and/or windows.

Locations 166 and 167 hold the vectors used by INDSTA and INDFET to stash and fetch bytes in BANK 1. Location 170 holds the color we will store into location 241, which defines the default foreground (character) color. Locations 171 and 172 hold the vectors to the screen location where we start drawing the window border. These locations are used to load the .X and .Y registers, respectively, then we JSR to PLOT ($FFF0) to set the cursor to the top-left corner of the window border.

The borders are drawn using the C-128's built-in Kernal routine, PRIMM ($FF7D), which is similar to the 64's STROUT ($AB1E). This routine is also discussed in the *Programmers' Reference Guide.*

Locations 175 and 176 are the vectors that point to the VIC screen, which normally starts at 1024 ($0400). Then these locations are changed to point to color memory at 55296 ($D800). Painless saves both the screen and color memory, so you can use different colors on your screen output to liven it up.

SYS 3200 will save the current text screen, including any existing overlays already placed, increment necessary zero-page pointers, and JSR to the draw routine to place the window border on screen and set the window with locations 228 to 231 ($00E4-$00E7). SYS 3300 will restore the screen under a given window, and decrement the zero-page pointers to prepare for another save or restore.

Just a few simple rules to remember when working with this routine; again be sure to make POKE 58,223:CLR the first line of your applications program. SYS 3100 is used to reset zero-page pointers to the first window overlay. SYS 3200 is used to save a screen and create a window and border. SYS 3300 is used to erase a window and restore the underlying screen. Don't try to SYS 3200 past the fourth window, or SYS 3300 below the first window, or the screen, and possibly your program, will be corrupted.

I hope all you programmers can learn something about using a few of the C-128's new Kernal calls from this program. Working late into the night on this program for several weeks, has helped sharpen my problem-solving skills, and shown me a reverence for the mighty 128. ■

Before typing this program, read "How to Enter Programs" and "How to Use the Magazine Entry Program." The BASIC programs in this magazine are available on disk from Loadstar, P.O. Box 30007, Shreveport, LA 71130-0007, 1-800-831-2694.

Window Loader

```
50050 REM     ******    POINTERS
      ******'BUAE
50060 FOR X=3100 TO 3138:READ A
      :POKE X,A:C1=C1+A:NEXT'IWME
50070 IF C1<>4431 THEN PRINT"[CLEAR,
      DOWN2]ERROR IN DATA LINES 50080
      -50090":END'GHTJ
50080 DATA 169,0,133,166,133,175,169,
      223,133,167'BMDE
50085 DATA 169,0,141,94,3,141,95,3,
      141,96,3,141,97,3'BQIK
```

```
50090 DATA 169,3,133,170,169,10,133,
      173,169,2,133,171,133,172,
      96'BDSI
50100 REM    ******    STORE
      ******'BRUA
50110 FOR X=3200 TO 3283:READ A
      :POKE X,A:C2=C2+A:NEXT'IWOA
50120 IF C2<>13335 THEN PRINT"[CLEAR,
      DOWN2]ERROR IN DATA LINES 50130
      - 50210":END'GISF
50130 DATA 169,19,32,210,255,32,210,
      255'BDHE
50140 DATA 169,166,141,185,2'BRND
50150 DATA 169,4,133,176,160,0,162,1,
      177,175,32,119,255'BTFE
50160 DATA 200,208,246,230,176,230,
      167,165,176,201,8,208,234'BYXF
50170 DATA 169,216,133,176,160,0,162,
      1,177,175,32,119,255'BVFG
50180 DATA 200,208,246,230,176,230,
      167,165,176'BKYF
50190 DATA 201,220,208,234,32,72,
      13'BYXE
50200 DATA 162,3,230,171,230,172,202,
      208,249,230,172'BQUF
50210 DATA 230,170,230,170,96'BSBB
50220 REM    ******    RESTORE
      ******'BTUD
50230 FOR X=3300 TO 3390:READ A
      :POKE X,A:C3=C3+A:NEXT'IWSD
50240 IF C3<>14780 THEN PRINT"[CLEAR,
      DOWN2]ERROR IN DATA LINES 50250
      - 50330":END'GIFI
50250 DATA 169,19,32,210,255,32,210,
      255,198,167,169,219,133,176,160,
      0,162'BMII
50260 DATA 1,169,166,32,116,255,145,
      175,200,208,244'BPMF
50270 DATA 198,167,198,176,165,176,
      201,215,208,232'BOLG
50280 DATA 169,7,133,176,160,0,162,1,
      169,166'BIHF
50290 DATA 32,116,255,145,175,200,208,
      244'BFBG
50300 DATA 198,167,198,176,165,176,
      201,3,208,232,230,167'BUYB
50310 DATA 162,7,198,171,198,172,202,
      208,249,198,172'BQNB
50320 DATA 198,170,198,170,198,241,
      198,241'BGGA
50330 DATA 32,236,13,96'BMRD
50340 REM    ******    DRAW   ******'BQFF
50350 FOR X=3400 TO 3509:READ A
      :POKE X,A:C4=C4+A:NEXT'IWXG
50360 IF C4<>8056 THEN PRINT"[CLEAR,
      DOWN2]ERROR IN DATA LINES 50370
      - 50450":END'GHNL
50370 DATA 165,170,133,241'BPEC
50380 DATA 24,166,171,164,172,32,240,
      255'BEFG
50390 DATA 32,125,255,18,32,32,32,32,
      32,32,32,32,32,32,32,32,32,32,
      32,32'BLZN
50400 DATA 32,32,32,32,146,13,0'BUCD
50410 DATA 160,9,165,172,133,236,32,
      125,255,18,32,29'BQMC
50420 DATA 29,29,29,29,29,29,29,29,29,
      29,29,29,29,29,29,29,29,32,146,
      13,0'BMLH
50430 DATA 136,208,222,165,172,133,
      236,32,125,255,18,32,32'BWTF
50440 DATA 32,32,32,32,32,32,32,32,32,
      32,32,32,32,32,32,32,32,146,
      13,0'BMJJ
50450 DATA 32,202,13,96'BMKA
50460 REM    ******    SET WINDOW
      ******'BVYE
50470 FOR X=3530 TO 3576:READ A
      :C5=C5+A:POKE X,A:NEXT'IWIJ
50480 IF C5<>6630 THEN PRINT"[CLEAR,
      DOWN2]ERROR IN DATA LINES 50490
      - 50520":END'GHLO
50490 DATA 165,171,105,1,133,229,105,
      8,133,228'BKNJ
50500 DATA 165,172,105,1,133,230,105,
      17,133,231'BLXB
50510 DATA 169,145,32,210,255,32,210,
      255,169,19,32,210,255,96'BAUF
50520 DATA 32,202,13,162,4,230,171,
      230,172,202,208,249,96'BVKF
```

END

Demo Program

```
100 POKE 58,223:CLR'CHGW
110 COLOR 0,1:COLOR 4,1'CHMY
120 PRINT"[CLEAR,WHITE]
     'PAIN'LESS WINDOW PANES
    DEMONSTRATION"'BAHI
130 PRINT"[DOWN,BLUE,SPACE3]
    THIS DEMONSTRATION WILL SHOW YOU
    WHAT"'BACJ
140 PRINT"'PAIN'LESS WINDOWS IS
    CAPABLE OF DOING. WE WILL FILL
    THE SCREEN WITH TEXT FIRST,"'BAUU
150 PRINT"SO THAT YOU CAN SEE HOW
    EACH WINDOW WILL"'BAUL
160 PRINT"NOT PERMANENTLY DISPLACE
    THE TEXT ON THE"'BANM
170 PRINT"SCREEN, BUT MERELY OVERLAY
    IT UNTIL YOU ARE DONE WITH THAT
    WINDOW."'BAQU
180 PRINT"[DOWN,GRAY2,SPACE5]
    EACH WINDOW CAN HOLD ANYTHING
    THAT"'BAVO
190 PRINT"YOU WISH; INSTRUCTIONS,
     MENUS, INPUT,"'BADO
200 PRINT"EVEN LO-RES PICTURES TO
    SPICE UP YOUR"'BAJG
210 PRINT"OWN PROGRAMS."'BAGB
220 PRINT"[DOWN,ORANGE,SPACE4]
    A NORMAL 'PRINT' STATEMENT WOULD
    BE"'BAWJ
230 PRINT"SUFFICIENT TO REPLACE THE
    TEXT, BUT NOT ANY USER INPUT THAT
    WAS ADDED AFTER"'BACT
240 PRINT"THE ORIGINAL SCREEN WAS
    PRINTED. BUT"'BADK
250 PRINT"'PAIN'LESS WINDOWS WILL
    REPLACE IT ALL!"'BACL
260 PRINT"[DOWN,BROWN]HERE IS AN
    EXAMPLE OF USER INPUT."'BAIM
265 PRINT"[HOME,DOWN21]"'BARJ
270 POKE 208,1:POKE 842,34
    :INPUT" ENTER YOUR FIRST NAME...";
    NM$'DRVO
```

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lects (via a menu driven option) the "slides" they want included and the sequence they want shown, the show begins. But the "slides" aren't simply flashed on the screen, they are shifted into view using one of three impressive video altering schemes. The three options are Sparkle, Shutter and Door. Each makes the graphic materialize on and fade off the screen in a most appealing and professional looking manner. I think this option would be ideal for businesses or schools wanting to use their C64's graphic abilities to illustrate a lesson, share information or sell a product. The manual doesn't suggest it, but "Slide Show" could also be used to insert graphics, pies, charts, etc., into business video presentations. Best of all, the program not only works, but it's easy to use.

The "Picture Printout" does just that—it dumps a graphic file, providing it is in the *Flexidraw* format, to your printer. This means if you want to use a drawing created with another graphic program, you'll need to use the "Image Conversion" option first.

The other feature which is a little unusual is called "PaperClip File Creator." It allows you to convert graphic files for use by the *PaperClip* word processor (revision C or greater). Five pages of the manual are dedicated to explaining how this is done, and from what I read the procedure is pretty straight forward, like all the other operations. Although I wasn't able to test the feature, I suspect those who do use *PaperClip* will be pleased with the results if it is as impressive as the rest of *Graphics Integrator 2*.

The program does have one option missing which should have been included and of which you should be aware. The conversion of graphics to *The Newsroom* format is a one way street. You can convert files so *The Newsroom* can use them, but you cannot convert *The Newsroom* graphics so they can be used by other graphic programs. While this doesn't greatly diminish the usefulness of *Graphics Integrator 2*, it does exclude a great source of graphic art since *The Newsroom*'s Clip Art selection disk has literally hundreds of graphics.

If you've read this far, I'm sure you're interested in knowing which programs are supported by *Graphics Integrator 2*; they are: *Flexidraw* (naturally), *ComputerEyes, Cad Pak 64, Super Sketch, Doodle!, Animation Station, Koala, Blazing Paddles, Billboard Maker, GEOS, Print Shop, Print Master, The Newsroom* and *PaperClip*. The program's direct print options support all of the more popular black and white printers and interfaces (as well as most of the less often used ones). It also works with the five top color printers—Canon, Diablo, Okidata and Epson.

Unfortunately, I don't have access to all of those programs or printers, but of those I used, all worked flawlessly with the program's options. The long list of software packages and peripherals that *Graphics Integrator 2* is coded to work with makes it clear just how many obstacles and hundreds of hookup combinations programmer Phillips had to test and conquer before he could finish the program. He deserves a financial applaud for the hours of efforts this product represents and his ability to bring a sort of standardization to the nonstandard graphic filing format nightmare.

The second product I want to mention in this review is *Graphics Galleria* also from Inkwell. In an effort to make *Flexidraw* more appealing (and all the other graphic programs too if you own *Graphics Integrator 2*) they have released the first in a a series of clip-art disks. The one I had a chance to look over is called *Clip Art Potpourri II*. The disk is double sided—one side stores *Flexidraw* formatted graphics and the reverse side contains the same graphics in *Doodle!* format. Each side holds 16 pages of graphics including everything from beer mugs to computers and Santa Claus. As you would expect, all the graphics are top notch and should be useful for anyone designing posters, greeting cards or anything which needs professional looking graphics. Soon to be released disks include Animals (it contains dozens of animals, both domestic and wild), Clip-Art (it has everything from fancy letters to fish), Maps of the World (what else—maps), Holiday Themes (turkeys, fireworks, valentines, ghosts, Santa, etc.), and Borders & Signs (fancy ending to frame your designs).

One parting remark—don't ask me why the program is called *Graphic Integrator 2* instead of #1. I don't know. I never saw, or heard of an earlier version. All I know is that #2 works. It is just what the user of multiple graphic programs needs to bridge the barrier which, until now, has prevented integration of alien graphics. So, if you are looking for something to add some real punch to your graphic capabilities, these offerings from Inkwell are worth a good long look. ■

by Graham Kinsey

Amiga Public Domain Software



What's new for the Amiga in the public domain? Here are some of the more recent public domain programs for the Amiga.

This month I'm not reviewing a certain category of Amiga public domain programs, but rather the best of the newest public domain programs that I have seen. Three of the most important programs I'm reviewing here are Morerows, which allows you to use the overscan of your monitor; Conman, which adds line editing and command histories to CLI; and AMIC PD Term, which has replaced Communicator as the king of the hill in public domain terminal programs. For each program, the author is given, and if that PD program is available on the Fish series, or the AMICUS series of public domain disks, the number of each series is also given. In many cases more than one disk will be listed in each series for a given public domain program. This means that an update to the program has been released and is also available on one of the mentioned disks in the series. I do not keep track of which programs are available on PeopleLink since virtually all of the programs mentioned in this column will be available for download in the libraries in the Amiga Zone on PeopleLink (if not by the time I write this, then certainly by the time this column is published). When a public domain program has been classified as shareware, this is also mentioned, along with the suggested amount.

ISpell: by Pace Willisson
(Fish 54)

ISpell is a CLI-oriented spelling checker. To use it, you just type the name of a text file that you want to check for spelling. If a word is misspelled, you can correct it online. If you misspell a word by only one character, the program will show you what words are similar to the misspelled word, so that you might recognize the correct spelling. ISpell comes with a huge hashed dictionary that is 300Kbytes big. Since ISpell loads the entire dictionary into memory at once, you need some expansion memory to use the program as supplied. Of course you can create your own dictionary (or size down the supplied one.) ISpell supports a Micro(GNU)Emacs interface. This program is definitely not for novices, but seasoned computer users might find it to be just right for them.

MoreRows: by Neil Katin and Jim Mackraz (Fish 54)

Usually the overscan area of a monitor is not used by computer programs, Amiga or otherwise. But with MoreRows, you can use the overscan area of your Amiga's monitor for many programs, including the CLI and Workbench! By using MoreRows, your CLI can display more rows and columns, and your Workbench will have more room to display windows and icons. To set up a disk with MoreRows you must first run the actual MoreRows program, and then when running the program, you tell it how much of the overscan area you want to use for the Amiga's display, in pixels. The largest values that work for a medium-resolution screen are 704 by 235 pixels (this is compared to a normal medium-resolution screen size of 400 by 200 pixels.) Next, you run and then save Preferences. You don't have to actually change anything, just load it and then save it. Finally, you reboot your Amiga and you will see that the maximum size of CLI and the Workbench have increased. To see the overscan area, assuming you have the Amiga 1080 monitor, adjust the vertical height control on the back of the monitor until you can see all 235 horizontal lines. Unfortunately, there isn't a horizontal width control, so the best you can do with the Amiga 1080 monitor is to use the horizontal position control to view most of the 704 vertical lines at a time.

PipeDevice: by Matt Dillon
(Fish 55)

As the name implies, this program creates a true working piping device. You cannot use it to pipe information from within one task, it must be used to pipe data from one task to another. Now you can transfer data from one program to another without having to use a temporary disk or memory file.

VT100: by Dave Wecker
(Fish 55)

This is the terminal program that Tek4010 (reviewed in the July installment) was based on. So, if a vt100 emulator with Xmodem, Kermit, and script files appeals to you, and you don't need Tektronix emulation, then this may be the program for you. Dave's VT100 program is up to version 2.6 (I believe the version that Tek4010 was based on is version 2.3), and many bug fixes have been made. There are also many minor improvements, including half duplex, auto word wrap, and command-key sequences for most menu items.

Icon2C: by Carolyn Scheppner
(Fish 56)

This program converts an icon into a C data structure, so that you can easily include any icon in a C program.

Mergemem: by Carolyn Scheppner
(Fish 56)

Mergemem merges the mountlist code for 2 different memory boards, so that the combined memory is treated as one continuous chunk. This is useful for two reasons. First, this helps to cut down on memory fragmentation. Second, it increases the largest possible piece of memory that can be allocated. (You may not think of any reason why one would want

to allocate a two megabyte chunk of memory now, but I'm sure that this will be common for Amiga programs 2 years down the road.)

Mousereader: by William Betz
(Fish 57)

This is a small text display program that is completely controlled by the mouse. You can also display an IFF picture in addition to text. A search feature is included, as well as the option to print the contents of the portion of text being viewed.

Splines: by Helen Taran
(Fish 57)

Simple curve fitting and rendering techniques are demonstrated with this demo. The user can plot any one of five different splines, relocate each of the three or more points being used, create new points and remove points. All drawings are in hi-res mode. The most unusual feature of this program is that is uses pop-up menus (as opposed to pull-down menus, which are the norm on the Amiga.)

Hyperbase: by Michael MacKenzie, Marc Mengel, and Craig Norborg
(Fish 58; Shareware: $25)

If you haven't purchased a database for your Amiga yet, this program may tide you over until you find one suited to your needs. Hyperbase has most of the really necessary features for a usable database. Features include searching (query), designing form printouts for your data, formulas, and sorting by a particular field. Hyperbase allows you to set the cache size for the number of records you want in memory at once. Keep in mind that the size of a record is variable, according to your field definitions, so that you will have to calculate how many bytes each record takes up.

Lots of command-key sequences are provided, which I feel are a must for such an input-intensive program as a database. A nice feature of Hyperbase is that even after you delete a record it is still there, just in case you made a mistake. You must force Hyperbase to actually delete records that have been marked as deleted. This may be a pain for those who think before they act, but for others this feature could save some grief. Even if you decide to delete all records that are flagged as deleted, Hyperbase keeps a backup copy of your database on hand, just in case you want to start over.

You must specify which database you want to load in at run-time. Hyperbase uses 3 of the 4 colors available from CLI/Workbench for emphasis.

Memclear: by John Hodgson
(Fish 58)

Memclear reduces memory fragmentation by combining adjacent pieces of free memory into one large piece. First, this program will examine the free memory list, then it will clear out the memory by writing zeros to all locations.

Programmable Clock: by Mark Waggoner (Fish 59)

This clock gives you many choices to make. You can decide whether you want to use an alternate font for your clock or just stick with Topaz 8. You can decide whether you want to set the clock (extremely useful for those without battery-backed clocks in their Amiga.) The clock can be programmed to stay in front of the screen at all times, or to pop up to the front every 15 seconds. You can choose 12 or 24 hour time, if the day of the week will be displayed and the format for the date. The color for both the foreground and the background of the clock can be changed (but only to one of the other 4 Workbench-/CLI colors being used at the time.) And best of all, all of these choices can be saved, so that you'll never have to reprogram this clock again!

Dropcloth: by Eric Lavitsky, Perry Kivolowitz, and ASDG Inc.
(Fish 59)

Are you bored with the plain look of your Workbench? Then spice it up! Dropcloth replaces the solid color of the Workbench background with a simple dot pattern of varying intensity. The dot intensity is user-definable at run-time.

Supermort: by Mark Schretlen
(Fish 59)

Supermort will compute just about any possible mortgage possibility. Three what-ifs can be calculated: periodic payments, full amortization or to meet a target principal, and to find a principal. The time for payments, compounding, term and amortizations are all selectable (from a list of possibilities).

Blitzfonts: by Hayes Haugen
(Fish 60; Shareware: $10)

Speedy text I/O is the purpose for using Blitzfonts. The author states that the maximum theoretical increase in speed is 586 percent, although the usual speedup is about 200-300 percent. The PD version only works on the standard font, Topaz 8, although if you send the shareware contribution, you will get a version that supports any other font that is as wide as Topaz 8.

Handshake: by Eric Haberfellner
(Fish 60; Shareware: $25)

This a VT100 emulator. It also fully supports both the VT52 and the full VT102 specification. One very nice feature of the program is that you can turn on interlaced mode, and have the Handshake screen shrink to half the size of the monitor screen, while still being able to see all 24 lines.

PrtDrvGen: by Joergen Thomsen
(Fish 60; Shareware: $10)

With PrtDrvGen you can create your own custom printer driver for the Amiga. You can choose to create an alphanumeric-only printer driver, or one that handles graphics as well. There are many parameters to input when creating the printer driver, including the size of the page, and the perforation skip length. Up to four graphic modes can be included in the driver. The aspect ratio for graphic dumps can be inserted, as well as any scaling or positioning you might desire of the graphic. The driver will act intelligently when blank lines have to be printed, so that the print head moves as little as possible. You can specify how colors are printed, and how print data is actually stored in the print buffer to best suit your printer.

Finally, if you don't have enough memory, a driver created with PrtDrvGen will just print "no mem" on your printer instead of possibly crashing. Let me emphasize here that unless you have a thorough knowledge of how printers work (especially yours!), you will find this program to be very complex and hard to use.

Uedit-Turbo: by Tom Althoff
(Fish 60)

The text editor Uedit (reviewed in the August installment) was designed to be completely programmable. Uedit-Turbo, tailor-made for writing C programs using the Aztec C compiler, is an example of what can be done with the programming features of Uedit. In addition to the normal editing features in Uedit, you can select an option that will execute the Make utility for the Aztec C language. And, if the compiler comes across an error in your C source code, Uedit will instantly scroll to the exact place where the error occurred! If you can't afford an expensive lint program for your Aztec C compiler,

this may be your best alternative.

ATpatch: by Philip Staub
(Fish 61)

There is only one thing to say about this program - It modifies the Amiga Transformer program so that it can operate under version 1.2 of the operating system.

Filldisk: by Fred Fish
(Fish 61)

Running this program during commercial software development could be the only thing that stands between you and piracy of your proprietary data (or in the case of copy-protection data, piracy of the program itself). This program first searches for all the free blocks on a disk and then writes a ton of garbage to each and every free block. This will thwart an attempt by someone to salvage the files that you thought had been deleted long ago via Disksalv or a disk editor.

Cookie: by Richard Stevens
(Fish 65)

This is your standard fortune cookie program. When you run it, a "fortune cookie" type saying will be printed. You can easily create your own data file full of your own sayings, or just add to the default data file.

JTime: by Michael Keryan
(Fish 65)

For those hardware hackers out there who haven't attempted to build anything for their Amiga yet, and would like to start with a small project, here is a project for building your own battery-backed clock. This clock will plug into the second mouse port (which is used as the joystick port by most people). The clock uses a normal 9-volt battery, and the cost of buying all the parts to build the clock should be less than $25. Hi-res IFF pictures are provided as schematics.

RunBack: by Charlie Heath
(Fish 65)

RunBack is for those of you who like to work only from Workbench, but want to run a program from your startup-sequence. RunBack will allow you to do this, while still being able to kill the initial CLI. For those of you with just 512K, you'll get back some much needed memory.

Conman: by William Hawes
(Fish 69; Shareware: amount not specified)

Those of you who have decided to stick with the CLI for better or worse will love this program. Conman adds line-editing and command histories to the standard CLI! Conman works by replacing the standard Console handler and library with a handler and library of its own. When inputing a CLI command, the left and right cursor keys can now be used, in addition to the backspace and delete keys. You can toggle between overwrite and insertion mode, and delete all characters from the cursor to the end of the line. Once you start to enter CLI commands, you will also find that the top cursor key shows you, one-at-a-time, the previous commands that have been entered. Of course, hitting return while looking at one of the old commands will tell CLI to execute it. By holding down the shift key, the top cursor key instantly brings you to the oldest command that is being stored. And the bottom cursor key will bring you to your present CLI input line.

The version of Conman on Fish 69 is version .90. Version .98 has some nice improvements. You can now delete whole command lines — either one at a time, or all the command lines that have been inputed but not acted upon by CLI. The way in which previous commands are stored has been changed. In version .90 the last twenty commands were stored. In version .98, a buffer is set up that will store as many CLI commands as will fit. The default buffer is only 488 bytes (enough for 20-30 average size CLI command lines), but by changing the value of a field in Conman's console library structure, you can choose the size of your command history buffer.

Certain function keys now allow you to automatically resize the CLI window. Several bug fixes have been made in version .98. The most important fix is that a Conman CLI can now be resized beyond 640 by 200 pixels if the screen is larger than that. This means that Conman now fully supports Morerows. Why use just your CLI better when you can make it bigger and better!

GravWars: by Ed Bartz
(Shareware: $5)

The object of this game is to fire a missile from your spaceship and destroy your opponent's spaceship. Between you and your opponent are planets, but these planets are more than just obstacles. The planets have gravities which play havoc with the direction of your missile, often forcing it to veer off harmlessly into space, and sometimes causing it to ram into one of the planets. The planets are of varying sizes and gravity fields. You also have to deal with black holes (which for this game are just basically invisible planets). Almost every feature in this game is completely user-selectable. You can choose how many planets you want to have on the playing field, create new planets, destroy planets you don't want, and move any planet around. Either ship can also be moved and you can decide whether to have the old missile trails left on the screen or not. You can also make the planets look plain, so you won't know how intense each planet's gravity field is.

Aux-Handler: by Steve Drew

This handler, when properly set up, will control the serial port as a console. As a result, you can run a new CLI that has the I/O flowing through the Amiga's serial port. If you have an ASCII terminal lying around, just hook it up to the Amiga's serial port, and your Amiga has now become a multi-user system! You could also allow someone to remotely access your computer by hooking a modem up to the serial port.

Hockey: by John Samuels
(Shareware: amount not specified)

No, this isn't some game played on ice with a puck - it is a simple card game, with some terminology taken from the game of Hockey. But forget the game itself, what will really cause you to love (or hate) this game is that your opponent, your Amiga, turns into a John McEnroe-style abuser, and constantly tries to verbally abuse and humiliate you! The fact that your opponent has an infallible memory while he plays makes his taunting all the more effective. Fortunately, if you start to feel like you want to take a sledgehammer and destroy your opponent, you can turn the speech off.

ADVSYS: by David Betz

Do you like text adventures? Have you ever thought of writing one, but were discouraged when you found out that you would have to use a language that was designed for general programs? Well relax, since now you can use ADVSYS, which is a language designed especially for writing text adventures. ADVSYS is a compiling language, but to play a compiled adventure, you must have an interpeter version and run it, using the compiled adventure data. ADVSYS allows you to program in virtually every facet concerning text adventures, including objects, places, actions, and properties of objects. ADVSYS also has a decent adventure parser, which

can handle multiple objects, multiple actions, adjectives, articles, and performing actions to objects.

Life3: by Bob Benedict
(Fish 70; Shareware: $20)

This is a three-dimensional version of the classic graphics program, Life. The universe in this version of Life is a cube that is 32 blocks long on a side. The walls of the cube are sterile (nothing can live there). You can design your own laws of the universe, save and reload a universe, change the origin of the universe, and change the viewing perspective. Let me warn you now that when this program runs, all multitasking is disabled!

WB-Strip: by Patrick Gross

This program will delete all unnecessary things on a standard Workbench disk (unnecessary for those who want the minimum number of files on their Workbench disk allowable). This program will wipe out the entire set of demos, fonts, printer drivers (the author says here to just copy the driver you need somewhere else and move it back here when WB-Strip is done),and keymaps. It will also kill most files in the Utilities and System directories. Let me state here that this program doesn't kill everything that isn't needed (for example, it doesn't kill the backup of Ed in the T directory, nor does it kill Edit, which hardly anybody uses). If you feel WB-Strip is convenient, then go ahead and use it. I feel that a properly written CLI batch file can do a better job, but it may be smart to include a call to WB-Strip in your batch file.

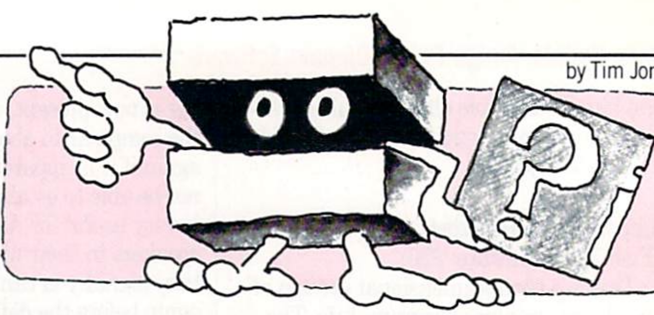
AMIC PD Term: by David Salas
(Shareware: $20)

AMIC PD Term (or just Amicterm for short), is based on version 1.34 of D.J. James Communicator terminal program. (Version 1.32 of Communicator was reviewed in the July Installment. Since version 1.32, minor improvements have been made to Communicator, including Charlie Heath-style file requesters, a status window, and the option to toggle on a title bar, so the Communicator screen can be pulled down.)

Even though Amicterm is still only up to beta version .40, it has already left Communicator behind and become a great program in its own right. Among the major additions is a sidebar full of gadgets, which when selected, execute many of the important commands and features used in Amicterm. Auto-redialing is now present, and you can even tell the computer to abort a dial, and dial over again if it is apparent that Amicterm will not be able to establish a connection. This is very useful for Amiga owners with speakers in their modem; so if you hear a busy signal you can tell Amicterm to try again before the default thirty second loop period is up (the time for each loop can be changed).

Amicterm supports ANSI color graphics and you can even adjust any of the colors at any time, or even load an entirely different palette of colors. The phone directory is much larger now, and in addition to just the name of the BBS or online service being displayed, the phone number, baud, and comment are all displayed from the phone directory. There are also several gadgets available in the directory (those of you who used the old terminal program Starterm will welcome this change). A new CLI can be brought up at any time as well as Ed, or any other text editor, if you want to change its name to ed. If you think that Amicterm sounds good already, keep in mind that this program is still in beta release, and there are a lot more features which still haven't been implemented (but are in the menus.) For example, script files will be supported. In addition to Xmodem and WXmodem protocols, Kermit, Zmodem (from the IBM world), and a special protocol called Multitalk will be added. Multitalk will allow you to both transfer files and perform normal telecommunications simultaneously. Amicterm also has menu options to both arc and unarc archived files while still online. So even though Amicterm is not yet finished, you might as well start using it, because when it is finished, it will certainly be a fantastic program. Even now, it is still the best general PD terminal program around.

Next month expect more of the same: the best in new Amiga public domain programs. I wasn't able to get Fish disks 66 through 74 in time to review programs in them this month, so expect to see reviews of programs from those disks next month, plus other new programs that are fresh off the Amiga bulletin boards. As always, I can be reached in the Amiga Zone on PeopleLink (ID: G KINSEY), or on the IDCMP BBS (617-769-8444, 8pm-8am). If you have written a public domain-/shareware/user supported program or have obtained one that you think is worth mentioning to all Amiga owners, then please attempt to contact me. See you next month.



by Tim Jones

AmigaBASIC Tutorial

Part 7: Requestors

A short program demonstrates difficult areas of AmigaBASIC, offering both tips on confusing areas and tricks to make life easier. This month, Requestors are examined and explained.

If you have run any of the programs that are available as commercial products or through the public domain, you have probably seen what is referred to as a Requestor. You know, the funny little box that opens up and asks you to enter a filename or to insert your workbench in any drive. Well, AmigaBASIC doesn't offer this capability directly. So, I figured that there must be a way to do it through some simple programming.

First, I took a tour through the ROM KERNAL and INTUITION manuals and the Sybex book *Amiga Programmer's Handbook* and tried to utilize the various Requestor functions. I found that this created quite a large module and made it difficult to incorporate the routines into any existing programs.

Finally, I played with the built-in graphics functions and found that I could cover a portion of the screen and then restore it using the GET and PUT commands. Using this method, the requestor can appear, accept input and then disappear without seeming to disturb the images below. Also, you don't have to keep up with any of the structures used in the Requestor functions.

In the requester SUB program, I have used the following variables as GLOBAL variables. To use the routines in your program, you will need to make sure that they are available and will not conflict with any other variables used by your program.

Variable Name	Description
Okay	If TRUE, then OK was selected else CANCEL was selected (Use for yes/no decisions).
FileName$	Returned from NameRequestor if OK or RETURN is entered. NULL if CANCEL is selected or if LEN (FileName$)=0.
TRUE	Indicative of its name (−1)
FALSE	As above (0)
BobR	Right most pixel location of the requestor. This can be changed according to your needs.
BobB	Bottom edge of the requestor
FNArraySize&	Function to determine the amount of memory to reserve for the GET and PUT used in the requestors. Note that the 2 at the end of the formula is the depth of the screen data you are saving. If you are using a 3, 4 or 5 bit plane screen, change this accordingly.
ScrSav&( )	Holds the array data for the GET and PUT operations
Rp&	This is a pointer to the RastPort address used by the currently active window structure (#1 in this example). It must be a LONG variable.
fSpk	Flag to indicate if Speech is activated (TRUE/FALSE)
M$	Should hold what you want spoken when the Requestor appears (if anything).
S%	Should contain the SAY information for Voice, Pitch, Speed, etc.

Other variables that I have used in the SUB programs are local and shouldn't confuse your program if used.

Prompt$	Up to 20 characters
Prompt2$	Up to 15 characters

The first two sections, RoutinesStarHere and DefineLibraryFunction MUST be included as the first part of your program to achieve the appropriate results.

These routines have been compiled with AbSoft's AC/BASIC and function as they should. ■

```
RoutinesStartHere:

' These first sections MUST be present in your program
  BobR = 230 : BobB = 90
  DEF FNArraySize& = 3+INT((BobR+16)/16)*(BobB+1)*2

DefineLibraryFunction:

  DECLARE FUNCTION Move LIBRARY
  DECLARE FUNCTION SetDrMd LIBRARY
  LIBRARY "graphics.library"
  SAY TRANSLATE$("") ' By placing this here, we force the
                     ' TRANSLATOR.DEVICE to be loaded early

InitAll:

  WINDOW 1,"Requester Demo",(0,0)-(631,186),0,-1
  FALSE = 0 : TRUE = -1
  Rp& = WINDOW(8)
  fSpk = FALSE
  COLOR 3
  PRINT : PRINT "Use the MENUs to run the demo"
  MENU 1,0,1,"Examples"
    MENU 1,1,1,"Yes or No"
    MENU 1,2,1,"String   "
  MENU 2,0,1,"Speech"
    MENU 2,1,2,"   Speech OFF"
    MENU 2,2,1,"   Speech ON "
  MENU 3,0,1,"Exit"
    MENU 3,1,1,"Exit"
  MENU 4,0,1,""

Main:

  ON MENU GOSUB MenuSel : MENU ON
  WHILE NOT Cows
    SLEEP
  WEND

MenuSel:
  MenuNum% = MENU(0) : MenuItem% = MENU(1)
  ON MenuNum% GOSUB Examples,Speech,Quit
RETURN

Examples:
  IF MenuItem% = 1 THEN
    Prompt$ = "This is the 1st line"
    Prompt2$ = "  This is the 2nd!"
    M$ = "this is a decision requester"
    YNRequester
    RETURN
  END IF
  IF MenuItem% = 2 THEN
    M$ = "Use this Requester to enter string information."
```

```
      NameRequester
      RETURN
    END IF
  RETURN
  Speech:
    IF MenuItem% = 1 AND fSpk THEN
      MENU 2,0,1,"Speech    "
        MENU 2,1,2,"    Speech OFF"
        MENU 2,2,1,"    Speech ON "
        fSpk = FALSE
      RETURN
    END IF
    IF MenuItem% = 2 AND NOT fSpk THEN
      MENU 2,0,1,"Speech    "
        MENU 2,1,1,"    Speech OFF"
        MENU 2,2,2,"    Speech ON "
        fSpk = TRUE
      RETURN
    END IF
  RETURN

  Quit:

    Prompt$ = "" : Prompt2$ = "  Exit (yes or No)?"
    M$ = "Eggzit to Basik"
    YNRequester
    IF NOT Okay THEN RETURN
    WINDOW CLOSE 1
    WINDOW 1,"Requester Demo",(0,0)-(617,186),15,-1
    LIBRARY CLOSE
    MENU RESET
    STOP

  SUB NameRequester STATIC
    SHARED Rp&,TRUE,FALSE,Prompt$,Prompt2$,M$,S%,
      fSpk,Okay,fExist
    Size& = FNArraySize&\2
    DIM ScrSav&(Size&)
    GET(40,40)-(230,90),ScrSav&
  DrawRequesterToScreen2:
    LINE(40,40)-(230,90),1,bf     'Main Requester box
    LINE(40,40)-(230,90),0,b      'outline for main Requester
    LINE(44,42)-(226,88),0,b      'secondary outline for  box
    LINE(50,74)-(72,86),3,bf      'OK button box
    LINE(50,74)-(72,86),0,b       'OK outline
    LINE(150,74)-(220,86),3,bf    'CANCEL button box
    LINE(150,74)-(220,86),0,b     'CANCEL outline
    CALL Move&(Rp&,53,83)         'Position for printing OK
    COLOR 0,3 : PRINT "OK"        'print it
    CALL Move&(Rp&,160,83)        'Position for CANCEL button
    COLOR 0,3 : PRINT "CANCEL"    'print it
    LINE(53,50)-(216,62),3,b
    Curs = 55
    LINE(Curs,52)-(Curs+7,60),2,bf  ' Print the pseudo-cursor
  CALL Move&(Rp&,53,71) : COLOR 0,1
    : PRINT "   Enter File Name"
  C$ = INKEY$
  WHILE C$<>"" : C$=INKEY$ : WEND 'Empty keyboard buffer
  FileName$ = ""
  IF fSpk THEN SAY TRANSLATE$(M$)

AccessLoop: ' Wait for click in string box or CANCEL

  I=MOUSE(0) : X=MOUSE(1) : Y=MOUSE(2)
  IF I<>0 THEN
    WHILE I<>0 :I=MOUSE(0) :X=MOUSE(1) :Y=MOUSE(2) :WEND
    Y=Y-1 ' This is due to a difference in MOUSE(2) and the
          ' actual Window location
    IF X>150 AND X<220 AND Y>74 AND Y<86 THEN ' CANCEL
      CALL SetDrMd&(Rp&,2) : LINE(151,75)-(219,85),0,bf
      CALL SetDrMd&(Rp&,1)
      Okay = FALSE : FOR Delay = 1 TO 1000 : NEXT Delay
      PUT(40,40),ScrSav&,PSET
      ERASE ScrSav& : COLOR 1,0 : EXIT SUB
    END IF
    IF X>53 AND X<216 AND Y>50 AND Y<62 THEN
      LINE(Curs,52)-(Curs+7,60),0,bf
      FOR Delay = 1 TO 50 : NEXT Delay
      LINE(Curs,52)-(Curs+7,60),2,bf
      WHILE INKEY$<>"" : WEND
      GOTO Loop
    END IF
  END IF
  GOTO AccessLoop

Loop: ' We do this until CANCEL, OK or Carriage Return

  C$=INKEY$ : I=MOUSE(0) : X=MOUSE(1) : Y=MOUSE(2)
  IF I <> 0 THEN
    WHILE I<>0 :I=MOUSE(0) :X=MOUSE(1) :Y=MOUSE(2) :WEND
    Y=Y-1 ' This is due to a difference in MOUSE(2) and the
          ' actual Mouse location
    IF X>150 AND X<220 AND Y>74 AND Y<86 THEN ' CANCEL
      CALL SetDrMd&(Rp&,2) : LINE(151,75)-(219,85),0,bf
      CALL SetDrMd&(Rp&,1)
      Okay = FALSE : FOR Delay = 1 TO 1000 : NEXT Delay
      PUT(40,40),ScrSav&,PSET
      ERASE ScrSav& : COLOR 1,0 : EXIT SUB
    END IF
```

```
    IF X>50 AND X<72 AND Y>74 AND Y<86 AND
      LEN(FileName$)>0 THEN ' Check for OK and length of file
      CALL SetDrMd&(Rp&,2) : LINE(51,75)-(71,85),0,bf
      CALL SetDrMd&(Rp&,1)
      FOR Delay = 1 TO 1000 : NEXT Delay
      Okay = TRUE : fExist = TRUE
      PUT(40,40),ScrSav&,PSET
      ERASE ScrSav& : COLOR 1,0 : EXIT SUB
    END IF
  END IF
   IF C$ = "" THEN GOTO Loop
   IF LEN(FileName$) = 0 THEN IF
     C$<"A" AND ASC(C$) <> 13 GOTO Loop
     ' Don't allow non-Alpha characters as first character
   IF ASC(C$) = 13 THEN
     Okay = TRUE : fExist = TRUE
     PUT(40,40),ScrSav&,PSET
     ERASE ScrSav& : COLOR 1,0 : EXIT SUB
   END IF
   IF ASC(C$) = 8 THEN
     ' Capture the BackSpace and fix display and filename
     FileName$ = LEFT$(FileName$,LEN(FileName$)-1)
     LINE(Curs,52)-(Curs+7,60),1,bf
     Curs = Curs-8 : LINE(Curs,52)-(Curs+7,60),2,bf
     GOTO Loop
   END IF
   IF LEN(FileName$) = 19 THEN BEEP : GOTO Loop
   IF ASC(C$) = 8 THEN Loop
   IF C$<" " OR (C$>"Z" AND C$<"a") OR C$>"z" GOTO Loop
   FileName$ = FileName$ + C$
   LINE(Curs,52)-(Curs+7,60),1,bf
   COLOR 0,1 : CALL Move&(Rp&,0,59) : PRINT PTAB(Curs);C$;
   Curs = Curs + 8 : LINE(Curs,52)-(Curs+7,60),2,bf
   GOTO Loop
 END SUB

 SUB YNRequester STATIC
   SHARED Rp&,TRUE,FALSE,Prompt$,Prompt2$,M$,S%,
        fSpk,Okay,fExist
   Size& = FNArraySize&\2 'reserve memory for the GET
   DIM ScrSav&(Size&) 'the actual array to hold the bitmap
   GET(40,40)-(230,90),ScrSav&  'defines a rectangle and
                                'remembers it as
   LINE(40,40)-(230,90),2,bf     'Main Requester box
   LINE(40,40)-(230,90),0,b      'outline for main Requester
   LINE(44,42)-(226,88),0,b      'secondary outline for main
   LINE(50,74)-(72,86),3,bf      'OK button box
   LINE(50,74)-(72,86),0,b       'OK outline
   LINE(150,74)-(220,86),3,bf    'CANCEL button box
   LINE(150,74)-(220,86),0,b     'CANCEL outline
   CALL Move&(Rp&,53,83)         'Position for printing OK
   COLOR 0,3 : PRINT "OK"        'print it
   CALL Move&(Rp&,160,83)        'Position for CANCEL button
   COLOR 0,3 : PRINT "CANCEL"    'print it
   CALL Move&(Rp&,54,52)         'Position for first text
   COLOR 0,2 : PRINT Prompt$     'print it
   CALL Move&(Rp&,54,62)         'Position for second text
   COLOR 1,2 : PRINT Prompt2$    'print it
   IF fSpk THEN SAY TRANSLATE$(M$)

GetButton2:

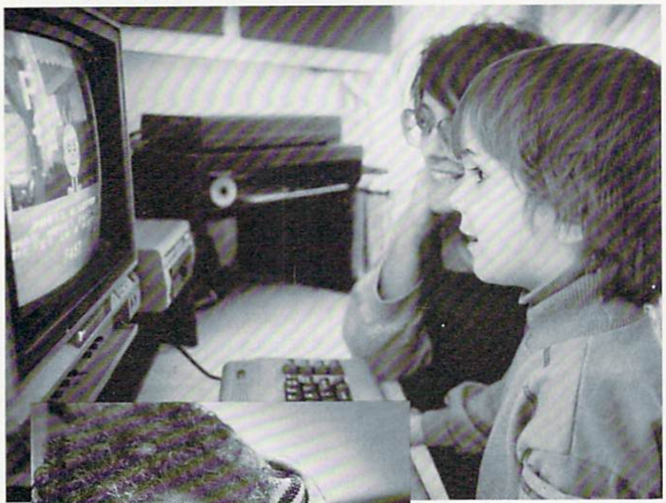
   ' This waits for a mouse click (left mouse button)

   I = MOUSE(0) : X = MOUSE(1) : Y = MOUSE(2)

   IF I <> 0 THEN
     WHILE I<>0
       I = MOUSE(0) : X = MOUSE(1) : Y = MOUSE(2) : Y = Y-1
     WEND
Cancel: ' Check to see if the CANCEL button is selected
     IF X>150 AND X<220 AND Y>74 AND Y<86 THEN
       CALL SetDrMd&(Rp&,2)      ' COMPLIMENT CANCEL button
       LINE(151,75)-(219,85),0,bf
       CALL SetDrMd&(Rp&,1)
       FOR Delay = 1 TO 1000 :NEXT Delay 'Let user SEE
                                         ' his/her choice
       PUT(40,40),ScrSav&,PSET ' Replace old screen display
       ERASE ScrSav&           ' Erase the Array
       Okay = FALSE            ' Indicates CANCEL selected
       COLOR 1,0
       EXIT SUB
     END IF
Ok:  ' Check to see if the OK button is selected
     IF X>50 AND X<72 AND Y>74 AND Y<86 THEN
       CALL SetDrMd&(Rp&,2)  ' COMPLIMENT the OK button
       LINE(51,75)-(71,85),0,bf
       CALL SetDrMd&(Rp&,1)
       FOR Delay = 1 TO 1000 : NEXT Delay ' Let user SEE
                                          ' his/her choice
       PUT(40,40),ScrSav&,PSET  ' Replace old screen display
       Okay = TRUE              ' Erase the Array
       ERASE ScrSav&            ' Indicates OK was selected
       COLOR 1,0
       EXIT SUB
     END IF
   END IF
   GOTO GetButton2 ' Until a button is selected
 END SUB
```

END

Continued from pg. 69



GARY FIELDS

The author's wife helps his son load and control the program the first couple of times. In short order, he was able to handle all the tasks by himself.



May Matthews, Computer Specialist for the Buncombe County School system, Asheville, NC.

For young children I like to see games that teach letters, shapes and colors.

Some Final Thoughts

Until controlled studies comparing large groups of students are done, the influence computers have on a student's ability to learn will be educated speculation. What has been observed is that computers matched with the right software can stimulate a child to think logically, reinforce their problem solving skills, and better use the intelligence they possess.

Like it or not, computers are here to stay. We usually think of keyboards and TV-like screens when we think of computers, but that is only one use of microchips. Nearly everything you touch has some sort of microprocessor ticking away inside.

Without a doubt, becoming comfortable with computers is very important, though the machine on which the literacy is acquired is less critical. Using a computer can be compared to driving a car—all cars and computers perform similarly. The difference is some have more options, more style, more speed, more support, as well as higher or lower price tags, but they all do more or less the same thing. Children can learn all they need to know about computers using the PET, VIC 20, Plus/4, Commodore 16, 64, 128, or the Amiga 500, 1000 or 2000.

Software for Students

"If the child doesn't seem to be interested in the computer, it may be the software," says May Matthews, computer specialist for the Buncombe County school system. "The parent should check with friends or the child's teacher for suggestions for better software packages. It is the software that makes the computer a tool that can teach or serve."

Because children learn faster when they enjoy their studies, locating stimulating software is an important learning concern. Here is a list of some proven software packages. I would, however, advise against buying the same programs already in use in the schools. Stocking your home with software the child already uses at school creates a stagnant learning environment.

For a young child, games that involve learning the alphabet and the computer's keyboard are suggested. Dozens of good ones are on the market, but my own son's favorite when he was three was called *I Love My Alphabet* from First Star Software. For learning shapes and colors, Springboard's *Stickers* is excellent. Another alphabet game is Spinnaker's *Alphabet Zoo*. Just for fun explore Bantam Software's *Fantastic Animals*.

As a child moves into elementary school, word games and problem-solving simulations are good. There are hundreds of good word games on the market, but my daughter enjoys Electronic Arts' *Scrabble* and Sierra's *Wiztype*. I've seen two good introductory level word processors for the 64: *Word Shuttle* by Commodore and *Kid Pro Quo* by Softsync. Both are designed for young children, yet are amazingly powerful and flexible. Most educators think Spinnaker's *In Search of the Most Amazing Thing* a good choice. Electronic Arts' *Robot Rascals* is a good multiple-player problem-solving game my five year-old loves.

Young teenagers should enjoy adventure/educational games like Scholastic Wizware's *Agent U.S.A.* Both of Broderbund's games, *Where in the World Is Carmen Sandiego?* and *Where in the U.S.A. Is Carmen Sandiego?* are wonderful games the child can enjoy. As a writer, I like to see children involved with creative writing. Woodbury Software has several programs packaged under the *Play Writer* title which allow children to write, illustrate, publish and bind their own books.

I've yet to see a child pass up a computer when it was being used to draw.

Activision's *Alter Ego* games (both female and male versions) are good for sparking children's interest in computers. They both work on a data base-like information source and are fun. Plus they help the child face and explore real life experiences and problems. Another Activision title called *Portal* frees the child to explore a future earth while on-line with a simulated computer terminal.

As soon as your child is required to write school papers, I highly recommend Broderbund's *Thinking Cap*. It is an outline processor that is perfect for organizing thoughts logically. (I'm well beyond my teenage years and I get a lot of help out of this one too.)

When your child becomes interested in music, few teachers can help more than a well designed music program. The three I like are Electronic Arts' *Music Construction Set*, Broderbund's *Music Shop* and Firebird's *Advanced Music System*.

When the child gets to high school, a good word processor is a must. For the 64 I suggest Timeworks' *Word Writer 3* (it

comes with the best spell check I've seen on any computer and includes a Thesaurus). If your child has a 128, I recommend either Precision Software's *Super Script 128,* Batteries Included's *PaperClip II* or Digital Solutions' *Pocket Writer 2.*

As a child moves into elementary school, word games and problem-solving simulations are good.

If you just want to get the child interested in a computer, regardless of age, try a graphics program. I've yet to see a child pass up a computer when it was being used to draw. I still like City Software's *Doodle,* which uses a joystick, but most kids prefer a light pen. Programs that require a light pen end up costing more since you must buy a light pen along with the software. There are two good products on the 64 market: Progressive Peripherals & Software's *Picasso's Revenge* and Inkwell's *Flexidraw.* If you have an Amiga, the kids will love Electronic Arts' *Deluxe Paint II.* Older children will like its sister program called *Deluxe Print* which serves as a mini printing press.

Creative software like Springboard's *The Newsroom,* Broderbund's *The Print Shop,* and Unison World's *Print Master,* as well as Berkeley's GEOS programs are great for getting high school students interested in computers. Those having access to an Amiga should investigate New Horizon's *ProWrite* word processor (with graphics) and Gold Disk's *Pagesetter* desktop publishing program. All make it simple for the student to release his or her individual creative visions while producing useful, professional looking printouts.

When it comes to simulation games, the Commodore systems are bursting with good ones. Sublogic's *Flight Simulator II,* MicroProse's *AcroJet* and *Gunship* are all worth looking into if you want a flight simulator. MicroProse and Strategic Simulations also market dozens of historical war simulations which not only stimulate older children's thought processes but teach a lot of history using hands-on experience during play.

If you are looking for good, affordable software you should also look into the treasures of public domain software. The advantage of public domain software is not only that it is free but that there are usually programs (many designed by teachers) which deal with specific subject matter. Because most are written in BASIC, your child (or you) can explore the inner workings of a program and learn a lot about the way computers and programming work by simple experimentation.

The disadvantage of public domain software is that most of the early programs lacked speed and their screen displays and sound effects were bland when compared with commercially-produced software. That is changing. Most magazines carry ads listing distributors which will duplicate disks filled with such programs for just a little more than the cost of the disk and postage. Local user's groups as well as your child's teacher should be able to either supply you with some software or direct you to a source.

Other sources of educational software are commercially maintained computer networks like CompuServe and Q-Link. Both maintain huge libraries of public domain software, much of which is educational. (The last catalog I received from Q-Link listed nearly 5,000 titles.) From a network, each file (program) will cost you only the connection time it takes to download it to your system. C

by James R. Schwartz

Sound Synthesizer

for the Commodore 64 and 128

Designing sound effects for the Commodore 64 can be a tedious job. Numerous pokes to the Sound Interface Device (SID) chip are required to make even the simplest of sounds. Keeping track of the frequency, waveshape and ADSR (attack, decay, sustain and release) parameters can be confusing. This is particularly true when you consider that sound is so subtle that even a minute change in even one parameter can have a drastic effect on the output.

Sound Synthesizer will help you design your own sound effects. It allows you to gently fine-tune the characteristics of the sound to get the exact audio output you want. It allows you to save the sounds to a tape or disk for future use. But perhaps best of all, at the touch of a key, the screen will display the BASIC commands needed to let you reproduce the sound effect in your own programs.

Because the SID chip and its register addresses are the same for both the 64 and the 128, this program will work equally well with both computers. However, 128 users should add the following line to the program: 45 FORI=1TO2:FORJ=1TO8STEP2: K=K+1:KEYJ,CHR$(132+K): NEXT:NEXT. If the program is intended to be run on the 128 in its 80-column mode, replace line 40 with 40 FAST:SF=130. For the 128 in 40-column mode replace the line with 40 SF=63.

How to Use the Program

After typing in the program listing (and saving a copy to disk or tape), run the program. The left side of the screen shows the parameters of the sound, labeled from one to nine and from A to E. To alter any characteristic, hit the key for that particular para-meter. For example, if you want to change the frequency of sound, hit 2. A flag will be displayed showing which parameter you have accessed. Next, use the cursor up and cursor down keys to adjust the value of that parameter. When the value is set at the desired point, hit RETURN. You may then adjust other parameters or hear the sound you have designed by hitting F1.

Once you have the sound you want, you can save the sound to tape or disk by hitting F2. You will then be prompted for the filename—be sure it is no longer than 16 characters.

F3 lists at the bottom half of the screen the BASIC commands needed to recreate the sound. Simply insert these commands as lines in your program in the place in which you want the sound to be heard.

To load previously played sounds, press F4. The computer will then read the disk or tape and change the displayed parameters to the saved sound's values.

F5 simply resets the program to its initial values. The preset sound is the sound of a flute played at note A, fourth octave. F6 allows you to exit the program.

The Physics of Sound

The creation of even a simple sound is actually quite complex. This section deals with each parameter and how its influence affects the final output.

Volume (parameter 1) is set between 0 and 15. The higher the



Not only design your own sound effects, but reproduce them in your programs.

number, the louder the sound. Note: If the volume is set at 0, no sound will be heard.

Frequency (parameter 2) determines the pitch of the sound. The range of values you can specify is between 0 and 3990 hertz (cycles per second). The higher frequency you specify, the higher the pitch. Again, if set to 0, no sound will be heard.

Duration (parameter 3) refers to the length of time the sound will be played. You may specify any range between 0 and 10 seconds in increments of one-tenth of a second.

The ADSR (attack, decay, sustain and release) registers (parameters 4 through 7) play an important role in the formation of a sound. Attack refers to the rate at which a sound reaches its highest volume. Decay is the rate at which the sound's volume decreases from its peak to its median level. Sustain is the sound's median level. And release is the gradual dissipation of the sound from its median level to silence.

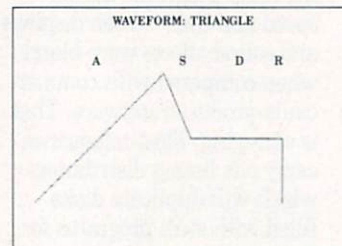


Figure 1

To see how the ADSR parameters come into play, look at Figure 1. This shows the graphic representation of the ADSR characteristics of the sound of a flute. Notice the long attack, during which the breath brings the note to its peak volume. The decay and release are the duration of the note itself. And the release, which in this case is non-existent, shows how the sound immediately ends once the note is stopped.

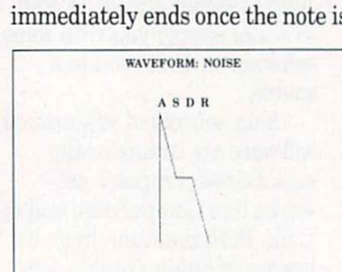


Figure 2

Now compare this to Figure 2, the graph of the sound of the crack of a bullwhip. Here there is no attack; the sound is immediately at full volume. Similarly, the decay and sustain are at a minimum. The slight release shows the shallow echo of the crack. Figure 3 shows how increasing the release dramatically changes the sound. The long release rate represents the echo of a gun report. Other than the release, the ADSR parameters here are identical to that of Figure 2.

When you are trying to create your own sound effect, try to visualize the sound as in the graphs. Does it have an explosive beginning, like cannon fire or a drum beat? If so, then decrease the

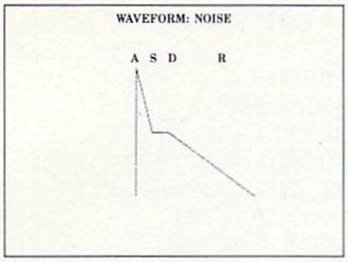


Figure 3

attack rate. Does the sound linger at its midrange value, like an organ? If it does, then adjust the decay and sustain parameters accordingly And if the sound lingers and dwindles to silence, like a bell lengthen the release rate.

For the ADSR parameters, remember that the higher the number, the longer the time that portion of the sound is played. The lower the number, the quicker the rate of change. The range of values for these four registers is from 0 to 15.

The next five parameters are for advanced sound programmers. Low pass filter (parameter 8) allows sound below the filter frequency (B) to pass undiminished. The band pass filter atenuates sounds slightly above and below the filter frequency. And the high pass filter allows the higher frequencies to pass unscathed. One, two, three, or none of the filters can be activated at once. The filters can be toggled on and off by use of the cursor keys. Resonance (C) can only be used when at least one of the filters is turned on. It determines the clearness of the sound. Once again, the range you may choose from is from 1 to 15. The higher the number, the sharper the sound.

Waveform (D) is an extremely important parameter. There are four different waveforms to choose from: triangle, sawtooth, pulse and noise. Triangle waves produce a soft, mellow sound, but somewhat hollow due to its lack of treble. Sawtooth waves sound tinny, and pulse waves have a wide variety of tonal qualities. The pulse waveform can also be changed by varying the pulse width (E). The noise waveform is especially good for the sound of explosions and rocket engines, as well as for percussion.

As you can see, the design and generation of sounds is very complex. Perhaps the easiest way to learn is just to experiment with the different parameters. Sound Synthesizer makes such experiment-ing easy and fun. And it can help you use your SID chip to its full potential. ■

Before typing this program, read "How to Enter Programs" and "How to Use the Magazine Entry Program." The BASIC programs in this magazine are available on disk from Loadstar, P.O. Box 30007, Shreveport, LA 71130-0007, 1-800-831-2694.

Sound Synthesizer

```
20 REM ***INITIALIZE***'BQYC
30 POKE 53281,11:POKE 646,1
   :POKE 53280,11'DXLF
40 SF=90'BEEB
50 DN$="[HOME,DOWN16]":RT$="[RIGHT19]
   "'CHDH
55 F$(0)="OFF":F$(1)=" ON"'CLSL
60 E$="[SPACE37]":S$=" "'CFLJ
70 DIM P(14),A(14),X(14):FOR I=1 TO 14
   :READ X:NEXT'GAXL
80 FOR I=1 TO 14:READ P(I):NEXT
   :FOR I=1 TO 14:READ A(I):NEXT'KVAO
85 FOR I=1 TO 4:READ WF$(I):NEXT'FLRO
90 PRINT"[CLEAR]1 VOLUME"'BARI
100 PRINT"2 FREQUENCY[SPACE12]HZ"
    :PRINT"3 DURATION[SPACE13]
    SEC"'CBVG
110 PRINT"4 ATTACK":PRINT"5 SUSTAIN
    [SPACE13,SHFT U,SHFT *15,SHFT I]
    "'CBUQ
120 PRINT"6 DECAY[SPACE15,SHFT -,
    SPACE15,SHFT -]"'BAOE
130 PRINT"7 RELEASE[SPACE13,SHFT -]
     F1 HEAR SOUND [SHFT -]"'BAAI
140 PRINT"8 LOW PASS FLTR[SPACE7,
    SHFT -] F2 SAVE SOUND [SHFT -]
    "'BATJ
150 PRINT"9 BAND PASS FLTR[SPACE6,
    SHFT -] F3 LIST LINE[SPACE2,
    SHFT -]"'BAWK
160 PRINT"A HIGH PASS FLTR[SPACE6,
    SHFT -] F4 LOAD SOUND [SHFT -]
    "'BAAM
170 PRINT"B FLTR FREQ[SPACE11,SHFT -]
     F5 RESTART[SPACE4,SHFT -]"'BAPM
180 PRINT"C RESONANCE[SPACE11,SHFT -]
     F6 END[SPACE8,SHFT -]"'BAMM
190 PRINT"D WAVEFORM[SPACE12,SHFT J,
    SHFT *15,SHFT K]"'BAKV
200 PRINT"E PULSE WIDTH[SPACE8]%"'BAMB
210 REM ***START/RESTART***'BTIC
220 GOSUB 1200'BEEY
230 FOR I=54272 TO 54294:POKE I,0:NEXT
    :RESTORE:FOR I=1 TO 14:READ X(I)
    :NEXT'LDFL
240 FOR X=1 TO 15'DEWC
250 ON X GOSUB 1120,1130,1150,1120,
    1120,1120,1120,1180,1180,1180,
    1130,1120'CKKN
260 IF X>12 THEN ON X-12 GOSUB 1190,
    1130'GPVI
270 NEXT:FOR X=1 TO 15'EFEG
280 ON X GOSUB 610,630,1100,650,660,
    650,660,610,610,610,670,620,1100,
    690'CIIQ
290 NEXT'BAEF
300 REM ***KEY SCAN***'BNCA
310 GET A$:IF A$=""THEN 310'EIDC
320 A=ASC(A$):IF A=133 THEN 710'FNCE
330 IF A=137 THEN 870'DHTD
340 IF A=138 THEN 950'DHTE
350 IF A=134 THEN 750'DHNF
360 IF A=135 THEN 210'DHFG
370 IF A=139 THEN END'EEPH
380 IF A>48 AND A<58 THEN X=VAL(A$)
    :GOTO 410'IPYN
390 IF A>64 AND A<71 THEN X=A-55
    :GOTO 410'IOFO
400 GOTO 310'BDDY
410 REM ***CHANGE PARAMETERS***'BWLF
420 PRINT LEFT$(DN$,X)"[RIGHT,SHFT Q]
    "'CHSD
430 GET A$:IF A$=""THEN 430'EIGF
440 A=ASC(A$):IF A=13 THEN PRINT
    LEFT$(DN$,X)"[RIGHT] ":GOSUB 1200
    :GOTO 590'JATN
450 IF A=145 THEN 480'DHPG
460 IF A=17 THEN 510'DGJH
470 GOTO 430'BDGG
480 IF X(X)>=A(X)THEN 430'ELXL
490 IF X=2 OR X=11 THEN X(X)=X(X)+10
    :GOTO 540'ITOQ
500 X(X)=X(X)+1:GOTO 540'DNJD
510 IF X(X)=0 THEN 430'DIVD
```

```
520 IF X=2 OR X=11 THEN X(X)=X(X)-1Ø
    :GOTO 54Ø'ITPK
53Ø X(X)=X(X)-1'CJSF
54Ø IF X=1 OR(X>=4 AND X<=7)OR X=12
    THEN GOSUB 112Ø:GOTO 43Ø'NTYP
55Ø IF X=2 OR X=11 OR X=14 THEN GOSUB
    113Ø:GOTO 43Ø'JQJN
56Ø IF X=3 THEN GOSUB 115Ø
    :GOTO 43Ø'FKDK
57Ø IF X>7 AND X<11 THEN GOSUB 118Ø
    :GOTO 43Ø'HNMN
58Ø GOSUB 119Ø:GOTO 43Ø'CICJ
59Ø ON X GOSUB 61Ø,63Ø,11ØØ,65Ø,66Ø,
    65Ø,66Ø,61Ø,61Ø,61Ø,67Ø,62Ø,11ØØ,
    69Ø'CIIU
6ØØ GOTO 3ØØ'BDCB
61Ø POKE 54296,X(1)+X(8)*16+X(9)*32+X
    (1Ø)*64'HEVL
62Ø POKE 54295,X(8)+(X(9)*2)+(X(1Ø)*4)
    +(X(12)*16):RETURN'IKVO
63Ø FO=X(2)/Ø.Ø6Ø97:HB=INT(FO/256)
    :LB=INT(FO-(256*HB))'JMNR
64Ø POKE 54272,LB:POKE 54273,HB
    :RETURN'DSSJ
65Ø POKE 54277,X(4)*16+X(6)
    :RETURN'ERNL
66Ø POKE 54278,X(5)*16+X(7)
    :RETURN'ERQM
67Ø H2=INT(X(11)/8):L2=INT(X(11)-
    (8*H2))'HAVQ
68Ø POKE 54293,L2:POKE 54294,H2
    :RETURN'DSRN
69Ø PW%=X(14)*4Ø.95:H3=INT(PW%/256)
    :L3=INT(PW%-(256*H3))'JOIX
7ØØ POKE 54274,L3:POKE 54275,H3
    :RETURN'DSRG
71Ø REM ***HEAR SOUND***'BPBG
72Ø DV=X(3)*SF'CIIG
73Ø POKE 54276,2^(X(13)+3)+1'EQRJ
74Ø FOR I=1 TO DV:NEXT:POKE 54276,Ø
    :GOTO 3ØØ'GRYM
75Ø REM ***LIST LINE***'BONJ
76Ø GOSUB 12ØØ'BEEI
77Ø PRINT DN$"POKE54272,
    "MID$(STR$(LB),2)":POKE54273,
    "MID$(STR$(HB),2)'FTTU
78Ø PRINT"POKE54274,"MID$(STR$(L3),2)"
    :POKE54275,"MID$(STR$(H3),2)'FQRU
79Ø PRINT"POKE54277,"MID$(STR$(X(4)
    *16+X(6)),2);'FRWT
8ØØ PRINT":POKE54278,"MID$(STR$(X(5)
    *16+X(7)),2)'FQAL
81Ø PRINT"POKE54293,"MID$(STR$(L2),2)"
    :POKE54294,"MID$(STR$(H2),2)'FQRO
82Ø PRINT"POKE54296,";'BBQH
83Ø PRINT MID$(STR$(X(1)+X(8)*16+X(9)
    *32+X(1Ø)*64),2);'JFOR
84Ø PRINT":POKE54295,"MID$(STR$(X(8)+
    (X(9)*2)+(X(1Ø)*4)+(X(12)*16)),
    2)'JJGV
85Ø PRINT"POKE54276,"MID$(STR$(2^(X
    (13)+3)+1),2)'GQMQ
86Ø PRINT"FORI=1TO"MID$(STR$(DV),2)"
    :NEXT:POKE54276,Ø":GOTO 3ØØ'EMHT
87Ø REM ***SAVE SOUND***'BPQN
88Ø GOSUB 1Ø3Ø:IF D$="T"THEN 91Ø'EKWO
89Ø OPEN 8,DN,8,"Ø:"+NM$+"S,W"'DKYQ
9ØØ GOTO 92Ø'BDKE
91Ø OPEN 1,1,1,NM$'BJQG
92Ø FOR I=1 TO 14:PRINT#DN,X(I)
    :IF ST=Ø THEN NEXT'IQYN
93Ø IF D$="D"THEN GOSUB 111Ø'EGYJ
94Ø CLOSE DN:FOR I=1 TO 1ØØØ:NEXT
    :GOSUB 12ØØ:GOTO 31Ø'HTBP
95Ø REM ***LOAD SOUND***'BPBM
96Ø GOSUB 1Ø3Ø:IF D$="T"THEN 99Ø'EKFN
97Ø OPEN 8,DN,8,NM$+"S,R"'CKWO
98Ø GOTO 1ØØØ'BEXM
99Ø OPEN 1,1,Ø,NM$'BJPO
1ØØØ FOR I=1 TO 14:INPUT#DN,X(I)
     :IF ST=Ø THEN NEXT'IQEB
1Ø1Ø IF D$="D"THEN GOSUB 111Ø'EGYW
1Ø2Ø CLOSE DN:FOR I=1 TO 1ØØØ:NEXT
     :GOSUB 12ØØ:GOTO 24Ø'HTDD
1Ø3Ø GOSUB 12ØØ:PRINT DN$
     :INPUT"(D)ISK OR (T)APE[SPACE2]
     D [LEFT4]";D$'DMLH
1Ø4Ø IF D$="T"THEN DN=1:GOTO 1Ø8Ø'FKLC
1Ø5Ø IF D$<>"D"THEN 1Ø3Ø'EGHC
1Ø6Ø INPUT"DEVICE #[SPACE2]8 [LEFT4]";
     ND$:DN=VAL(ND$)'DMCI
1Ø7Ø IF DN<8 OR DN>11 THEN PRINT"[UP2]
     ":GOTO 1Ø6Ø'HMYI
1Ø8Ø INPUT"FILE NAME";NM$'BEGE
1Ø9Ø IF LEN(NM$)<1 OR LEN(NM$)>16
     THEN PRINT"[UP2]":GOTO 1Ø8Ø'JSEM
11ØØ RETURN'BAQT
111Ø OPEN 15,8,15:INPUT#15,A$,B$,C$,D$
     :PRINT A$S$B$S$C$S$D$:CLOSE 15
     :RETURN'FQQG
112Ø PRINT LEFT$(DN$,X)LEFT$(RT$,
     P(X))RIGHT$("[SPACE2]
     "+MID$(STR$(X(X)),2),2)'HGDH
1125 RETURN'BAQB
113Ø PRINT LEFT$(DN$,X)LEFT$(RT$,
     P(X));'DSVD
114Ø PRINT RIGHT$("[SPACE4]
     "+MID$(STR$(X(X)),2),4)
     :RETURN'GPWF
115Ø JM$=MID$(STR$(X(3)),2)
     :JM$=LEFT$(JM$,LEN(JM$)-1)
     +"."+RIGHT$(JM$,1)'KLVN
116Ø PRINT LEFT$(DN$,3)LEFT$(RT$,
     18)RIGHT$("[SPACE2]"+JM$,4)'FWSI
117Ø DV=VAL(JM$)*1E3:RETURN'ELHG
118Ø PRINT LEFT$(DN$,X)LEFT$(RT$,
     17)F$(X(X)):RETURN'EYFJ
119Ø PRINT LEFT$(DN$,13)LEFT$(RT$,
     15)WF$(X(X)):RETURN'EBVL
12ØØ PRINT DN$"[UP]":FOR I=1 TO 7
     :PRINT E$:NEXT:RETURN'HMXC
121Ø DATA 12,44Ø,3Ø,9,4,4,Ø,Ø,Ø,Ø,4ØØ,
     Ø,1,5Ø'BJPC
122Ø DATA 18,16,18,18,18,18,18,17,17,
     17,16,18,15,16'BQMF
123Ø DATA 15,399Ø,1ØØ,15,15,15,15,1,1,
     1,2Ø4Ø,15,5,1ØØ'BSRG
124Ø DATA"[SPACE2]TRI","[SPACE2]SAW",
     PULSE,NOISE'BNJF
```

END

by Paul Higginbottom

C Tutorial

Part 7

At the end of the last article I asked you to modify the skipwhitespace program to count the number of words typed on a line and print that number.

Here's the original program again.

```
/* make the line buffer global to avoid lots of parameter passing */
char linebuffer[80];
main()
{
 extern void skipwhitespace(); /* this doesn't return anything */
 int index;
 gets(linebuffer);       /* input a line of text */
 index = 0;         /* start at the beginning */
 skipwhitespace(&index);     /* skip over any white space */
 printf("%s\n", &linebuffer[index]);
 /* print text beyond white space */
}
void skipwhitespace(iptr)
int *iptr;
{
 while (linebuffer[*iptr] != '\0') { /* while not at end of string */
  switch(linebuffer[*iptr]) {
   case '\t': /* skip these... */
   case '\n':
   case ' ':
    break;
   default: /* must have found something which isn't white space */
    return; /* exit stage left... */
  }
  ++(*iptr); /* advance index */
 }
}
```

The skipwhitespace function can now be left alone, because we know what it does and need not concern ourselves with it anymore. This is the nice thing about modular programming. If a function does what you want, you can forget about it, confident that it has become a "trusted function". That is not to say you might not have to modify it in the future if you wish to enhance its capabilities. Modular programming, however, does let you concentrate on the "bigger picture".

Our concern then, is with the main function. It must now repeatedly call skipwhitespace and a new function skipword incrementing a counter after each time through, and breaking out of the loop once the end of the line is reached.

The modified program looks like:

```
/* make the line buffer global to avoid lots of parameter passing */
char linebuffer[80];
main()
{
 extern void skipwhitespace();
 extern void skipword();
 int index;
 int wordcount;

 gets(linebuffer);       /* input a line of text */
 index = 0;         /* start at the beginning */
 wordcount = 0;
 while (linebuffer[index] != '\0') {
 /* while we haven't reached the end */
  skipwhitespace(&index);    /* skip over any white space */
  if (linebuffer[index] != '\0') { /* if we're not now at the end */
   ++wordcount;     /* there must be a word here */
   skipword(&index);
  }
 }

 /* print an appropriate message depending on how many words found */

 switch(wordcount) {
  case 0:
   printf("No words entered.\n");
   break;
  case 1:
   printf("1 word entered.\n");
   break;
```



ART BAXTER

```
  default: /* must be multiple words */
   printf("%d words entered.\n", wordcount);
   break;

 }
}

void skipwhitespace(iptr)
int *iptr;
{
 while (linebuffer[*iptr] != '\0') { /* while not at end of string */
  switch(linebuffer[*iptr]) {
   case '\t': /* skip these... */
   case '\n':
   case ' ':
    break;
   default: /* must have found something which isn't white space */
    return; /* exit stage left... */
  }
  ++(*iptr); /* advance index */
 }
}

void skipword(iptr)
int *iptr;
{
 while (linebuffer[*iptr] != '\0') { /* while not at end of string */
  switch(linebuffer[*iptr]) {
   case '\t': /* skip these... */
   case '\n':
   case ' ':
    return;
   default:
    break;
  }
  ++(*iptr); /* advance index */
 }
}
```

Note how the skipword ( ) function is simply the opposite of the skipwhitespace ( ) function (which is, after all, what we want) in that it returns upon finding white space or reaching the end of the string, and continues otherwise.

One way to improve this program is to use character pointers into our line of text, instead of the current array and subscript.

In order for the functions skipwhitespace ( ) and skipword ( ) to inform main ( ) of where they reached, they will be passed the current text (char) pointer into the line, and they will return the new value.

For example:

```
/* make the line buffer global to avoid lots of parameter passing */
char linebuffer[80];
main()
{
 extern char *skipwhitespace();
 extern char *skipword();
 char *bufptr;
 int wordcount;
 gets(linebuffer);       /* input a line of text */
 bufptr = linebuffer;     /* start at the beginning */
 wordcount = 0;
 while (*bufptr != '\0') {    /* while we haven't reached the end */
  bufptr = skipwhitespace(bufptr); /* skip over any white space */
  if (*bufptr != '\0') {     /* if we're not now at the end */
   ++wordcount;     /* there must be a word here */
   bufptr = skipword(bufptr);
  }
 }

 /* print an appropriate message depending on how many words found */
```

```
 switch(wordcount) {
  case 0:
   printf("No words entered.\n");
   break;
  case 1:
   printf("1 word entered.\n");
   break;
  default: /* must be multiple words */
   printf("%d words entered.\n", wordcount);
   break;
 }
}

char *skipwhitespace(bufptr)
char *bufptr;
{
 while (*bufptr != '\0') { /* while not at end of string */
  switch(*bufptr) {
   case '\t': /* skip these... */
   case '\n':
   case ' ':
    break;
   default: /* must have found something which isn't white space */
    return(bufptr); /* exit stage left... */
  }
  ++bufptr; /* advance index */
 }
 return(bufptr);
}

char *skipword(bufptr)
char *bufptr;
{
 while (*bufptr != '\0') { /* while not at end of string */
  switch(*bufptr) {
   case '\t': /* skip these... */
   case '\n':
   case ' ':
    return(bufptr);
   default:
    break;
  }
  ++bufptr; /* advance index */
 }
 return(bufptr);
}
```

Now you have seen how functions can return values or pointers, and how pointers can be manipulated which is particularly useful for examining or changing arrays. Now it is time to learn of possibly the most important (in my opinion) variable type in C: The structure. A structure variable is one which contains one or more variables allowing them to be manipulated as a group. A structure is defined by the programmer, and as such, can group together variables of any kind, including other structures!

Rather than confuse you further with more explanations, let's look at an example structure definition. Since structures are program-defined, they must be defined first, and then variables of that type are created. For example:

```
struct Record {
 char FirstName[10];
 char LastName[30];
 char Telephone[20];
 int Age;
};
```

The example defines a structure type called Record. A Record contains 3 character arrays and one integer. Note that we have not created any variables at this point, we have simply defined the Record structure. Having defined a structure, we can create variables of this type. For example:

struct Record Temp;

This creates a variable called Temp, which instead of holding a single value like an integer, or a character, or a pointer, it contains all of the variables that were specified in the structure definition. To access each of the variables within the structure, we use the variable name and the name of the variable inside the structure, separated by a period. Therefore, if we wish to get the Age variable from within the Record structure Temp, we use:

Temp.Age;

To print out the name in Temp we could use the following code:

printf("%s %s\n", Temp.FirstName, Temp.LastName);

This would print out the first and last name variables within the Temp structure variable, separated by a space. Note however, that in simply declaring the variable Temp, the variables within it will not contain any meaningful information, so until they have been "filled in" with some values, it would be useless to print out the contents.

So what use are structures? They allow the programmer to create variables types which contain information, which is easier to manipulate if kept together as one unit. For example, if we were writing a database which allowed the user to open multiple files of records simultaneously, the variables which might describe the state and type of each database file in use could be put in a structure:

```
struct File {
 int Records; /* total number of records in the file. */
 int Current; /* current record being examined. */
 int Fields;  /* number of fields per record */
 /* etc. */
};
```

By putting variables associated with each open file in a single variable block, it allows easier reference of the variables, rather than having to create a unique set of variable names for each open file. For example, let's suppose the database allowed a maximum of two files, A and B, to be open simultaneously. Without structures, we would probably have defined a set of variables for each open file, i.e.:

```
int A_Records; /* total number of records in the A file. */
int A_Current; /* current record being examined in the A file. */
int A_Fields; /* number of fields per record in file A. */
/* etc. */

int B_Records; /* total number of records in the B file. */
int B_Current; /* current record being examined in the B file. */
int B_Fields; /* number of fields per record in file B. */
/* etc. */
```

This is ugly and tedious. Using the structure definition, we can use:

struct File A, B;

To reference the equivalent of B_Records, for example, we now use:

B.Records; /* hardly worse than B_Records! */

To make this idea more extreme, let's now suppose the database allowed up to 10 files to be open simultaneously. SURELY YOU WOULDN'T WANT TO TYPE:

```
int A_Records; /* total number of records in the A file. */
int A_Current; /* current record being examined in the A file. */
int A_Fields; /* number of fields per record in file A. */
/* etc. */

int B_Records; /* total number of records in the B file. */
int B_Current; /* current record being examined in the B file. */
int B_Fields; /* number of fields per record in file B. */
/* etc. */

(lots of article space omitted!)
.
.

int I_Records; /* total number of records in the I file. */
int I_Current; /* current record being examined in the I file. */
int I_Fields; /* number of fields per record in file I. */
/* etc. */

int J_Records; /* total number of records in the J file. */
int J_Current; /* current record being examined in the J file. */
int J_Fields; /* number of fields per record in file J. */
/* etc. */
```

Even using structures, we probably wouldn't use:

struct File A, B, C, D, E, F, G, H, I, J;

Structures like other variables can be grouped in an array. So in this example, we would probably use:

struct File Files [10];

The syntax for referring to elements within a structure within an array are consistent (and should be obvious), for example:

Files[2].Age;

The above example extracts the Age variable from the third (not second, remember arrays start at element ZERO) File structure in the Files array. Now comes the logical next step. . . POINTERS to structures! Example:

struct File *CurrentFile; /* points to the current database file */

The variable CurrentFile is a pointer to a structure of type File. It can be initialized to an element in the array by assigning it with the address of that element. For example:

CurrentFile = &Files[2]; /* point to the third file */

I've ommitted one detail — how does one access variables within a structure using a pointer to it? Well, let's think back to pointers to 'normal' kinds of variables. For example:

```
int *IntPtr;
int SomeInteger;

IntPtr = &SomeInteger;  /* point our pointer to the integer value */
printf("%d\n", *IntPtr); /* that's the ticket! Nyeah, use the '*' */
```

Going back to CurrentFile then:

*CurrentFile.Age;

This would seem to be the correct syntax for accessing the Age variable from the structure which CurrentFile points to. Alas, it isn't. What the above means is:

'Get what CurrentFile.Age points to',

and not (what we want):

'Get what CurrentFile points to, and then access the Age variable'.

Technically, this is due to the fact that the '.' (get variable of, not a decimal point) operator has a higher precedence than (is looked at by the compiler before) the '*' (points to, not multiply) operator, and so is evaluated first. Parentheses can be used to force a different order of evaluation, so:

(*CurrentFile) .Age;

Will reference what we want. However, those thoughtful C designers made an easier syntax, sometimes referred to as the 'pointy' operator:

CurrentFile->Age;

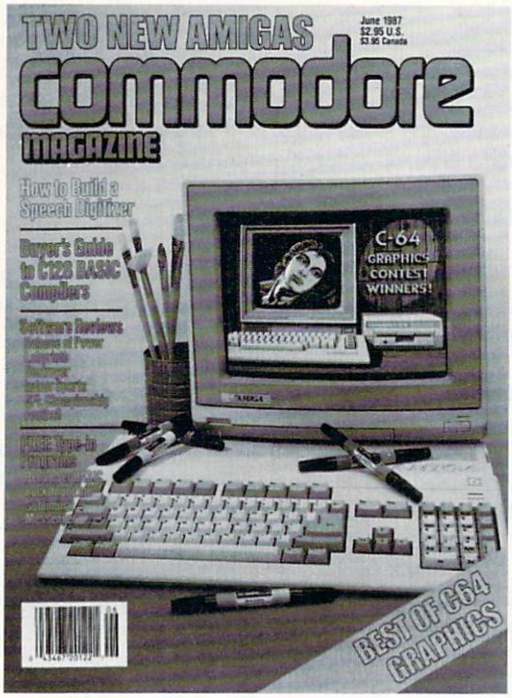
To recap then, to access a variable within a structure pointed to by a pointer, you use <pointer> <pointy> <variable within structure>.

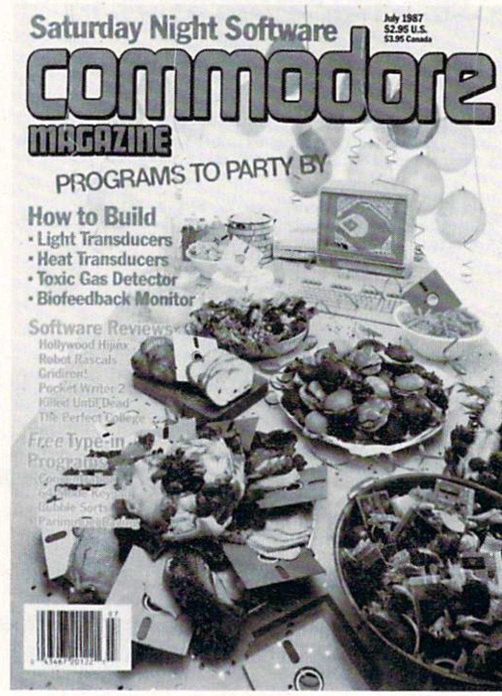
Refer to the earlier article explaining pointers vs. array subscripting to refresh your memory as to why using a pointer is more efficient.

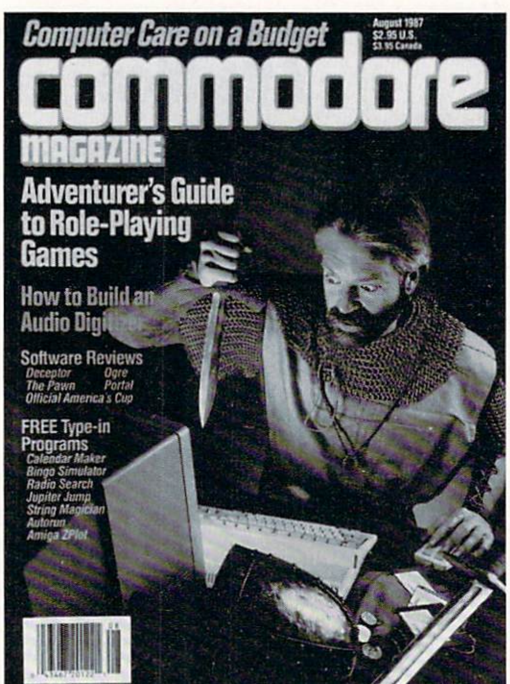
C

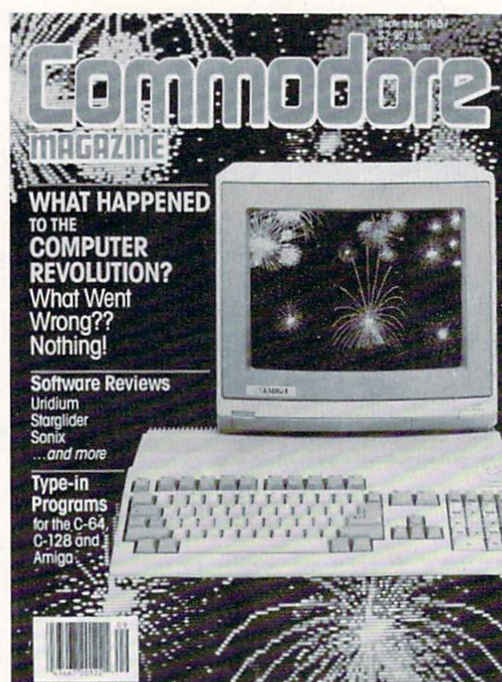
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Continued from pg. 72

bles an interactive text adventure game, even though it has beautiful graphics and some near-arcade action. I would have preferred that Sinbad was able to retreat from fights more easily, and that Captain McCormick had some help on his mission. Both games could be improved with an option to practice the skills required in each, rather than being forced to learn during actual combat. For instance: if Sinbad lands on the island which the Cyclops calls home, he is forced to fight an almost unwinnable fight. You must master throwing a rock with a sling, while the Cyclop tosses boulders at you (prepare to meet your maker unless your name is "Little David"). As Captain McCormick you are thrown into battle against overwhelming odds, without even the chance to fly your starfighter around the block

> *S.D.I.* is nearly a full megabyte of code and *Sinbad* is so large it requires two disks.

first. Yet, while the President complains that you let millions die, he never sends as much as a cub scout to help you defeat the entire Russian evil. Give me a break — where are the Marines when you need them?

Perhaps my complaints are rooted in my frustration — I've yet to finish either adventure successfully. I guess if you are going to be a real hero, you have to do it solo and you have to overcome overwhelming odds. If that's what you want, both games offer you the chance to accomplish heroic feats against truly humbling obstacles. There is no scoring here, either you win or you die.

The mere description of the action and adventure these two games simulate only begins to convey the truly unique experience both make possible. Both games are state-of-the-art. The action, displays, challenge and adventure they offer cannot be matched anywhere else on the market at this writing. The background sound is effective and I thought added to the atmosphere, but may be turned off if you prefer.

Both adventures are massive coding marvels — *S.D.I.* is nearly a full megabyte of code stored on one disk and *Sinbad* is so large it requires two disks. This size is both good and bad. Because neither game will fit inside a 512K Amiga, the disk drive must be accessed several times as action moves from location to location or a new screen is called into memory. Fortunately, the speed of Amiga's drive limits these delays to only a few seconds, but even these delays can wear your patience when you are trying to save the world. I objected to the delay with *S.D.I.* more than *Sinbad* because all the action in this space adventure is played in realtime — fast realtime.

After the fifth or sixth time of loading the game, I noticed a short message on the first screen which referred to using a RAM disk for speed. I asked the people at Progressive Peripherals for the loan of their two megabyte RAM expansion board to try *S.D.I.* at its fastest. While the difference in speed probably isn't worth buying an extra megabyte of memory, if you have that much memory be sure to use it. By loading the entire game into RAM, switching between screens is more realistic and noticeable faster. A document file on the game disk gives complete instructions on how to load RAM using a CLI window. I suggest you copy the instructions into a batch file which you can activate with a few keystrokes. I'm surprised the game designers didn't include such a file, but creating your own is worth the minor trouble.

To be classified a good game, it must be one you'll come back to again and again because of the challenge and fun it offers. Both of these pass that test with no reservations. If nothing else, the two are worth seeing just to witness what amazing and realistic displays are possible on the humble monitor screen. If the quality of these two indicates how much improved games can become in just a few years, I truly look forward to the realism and challenge the next generation of games will bring. But programmers are going to have to do some pretty amazing coding to surpass these two.

Computer: Amiga
Company: Mindscape Inc.
3444 Dundee Road
Northbrook, IL 60062
Publisher: Master Designer Software
Medium: Disk
512K Required
Price: $49.95 each

Continued from pg. 16

1670 auto-answer disable: Commodore's 1670 modem has the undesirable habit of answering incoming telephone calls to humans. If you leave your modem connected while working on non-modem tasks, you may have encountered the problem.

This short program disables the auto-answer feature. If you put it at the beginning of other programs, they'll be safe from this annoying trouble.

David M. Jones
Los Angeles, California

```
10 REM 1670 AUTOANSWER DISABLE - JONES
20 OPEN 5,2,3,CHR$(8)+CHR$(0)
30 FOR X=1 TO 7
40 PRINT#5,MID$("[SHFT A,SHFT T,
   SHFT S]0=0",X,1);
50 NEXT
60 CLOSE 5
```

DPS-1101 print wheels: I treasure my Commodore letter-quality printer, but I've had problems getting print wheels to fit it. It's easy to find print wheel suppliers, but it's hard to know which of their many types will work in the DPS-1101. Although most office supply stores have print wheels in their catalog, they seldom keep them in stock, so you can't compare them with your original. Even worse, the suppliers' cross-reference tables almost never include Commodore, and the DPS-1101 manual doesn't identify suppliers.

After months of searching, I've finally found what to get. GP Technologies, a very large print wheel manufacturer, has a series of wheels that's perfect for the DPS-1101. Many office supply stores carry their print wheels and other products. If you call GP at 800-523-1809 or 201-722-7165, they can direct you to your nearest dealer.

The product you're looking for is called Dual Plastic Printwheel for Royal/Adler (Group 02). There are seven different typefaces available, in 10 and 12 pitch plus proportional spacing. Price is in the $25 range. I know these wheels work with the DPS-1101, because I've tried one of them in my own. My typeface is Orator, a 10-pitch face with very large letters. A few of its special symbols (ten to be exact) are different from those on my original wheel, but most of them are ones I've never used. The single exception is the up-arrow, which appears on the original wheel as a carat or circumflex. On the Orator wheel, for some reason, it's a triangle.

Other manufacturers surely have wheels for the DPS-1101, but I haven't run across them. GP says they are for use on most Royal and Adler typewriters and Juki printers. That information might let you cross-reference to another maker's wheels, but be careful.

Louis F. Sander
Pittsburgh, Pennsylvania

Easier printer control: Most printers have a complicated series of escape sequences and/or special characters that control their special features. I can never remember all of them, so I've made up some lines to define them all in terms that are easy to remember. My printer is a Star NX-10C, but a similar technique can be used with any other machine.

Here's part of my little program:

```
10 ES$=CHR$(27) : EX$=CHR$(14) : CE$=CHR$(15)
20 UN$=CHR$(45) : AA$=CHR$(48) : BB$=CHR$(49)
```

These variable names have mnemonic value, as can be seen from their definitions:

ES$ is EScape
EX$ is for EXpanded printing
CE$ is to Cancel Expanded printing
UN$ is used for Underlining
AA$ clears underlining and several similar features
BB$ sets the features cleared by AA$

To use this system, I take the lines defining my printer variables and put them at the start of my main program. Then to go into, let's say, expanded printing, I just have the program PRINT EX$. Enabling underlining requires an Escape followed by a CHR$(45) and a CHR$(49). As long as my variables are defined, I can enable it by PRINT ES$;UN$;BB$. Simple, eh?

Kenneth Burrows
McMinnville, Oregon

Enhanced warranty: Commodore products and many products for Commodore systems come with a 90-day warranty from the manufacturer. In many cases, you can double the warranty to 180 days if you pay for the product with an American Express credit card. For details, see your cardmember literature on American Express Buyer's Assurance or write that department at Torrance, CA 90504.

D.L. Jassby
Princeton, New Jersey

Unseen characters in a string: Have you ever had a string print out strangely on the screen or even clear the screen entirely? If so, it was probably because there were some control characters embedded in the string.

One way to test for this is to use the LEN function to find the length of the string, then compare this length with the visible portion of the string after printing. For example, if the string is A$, then you might PRINT LEN(A$) : PRINT A$.

Another trick is to print a quotation mark before the string. This lets you see the quote-mode equivalents of the control characters. In our example you could do this by

PRINT LEN(A$) : PRINT CHR$(34);A$

Sometimes it's helpful to see exactly where the string begins and ends on the screen. For this, I use the three-character sequence "#". The quotes and the number sign are next to one another on the keyboard, so it's very easy to type the sequence. An example of using this would be PRINT "#" A$ "#".

Please note from our examples that the semicolon is optional as a separator of the items you are printing. I usually like to use it, however, since it makes programs easier to read.

Mike Reeves
Klamath Falls, Oregon

Debugger's helper: When a program isn't running the way it should, sometimes it's questionable whether a certain line was actually executed. A very simple way to find out is to insert an illegal character such as a bracket immediately after the line number in the line you want to check. Then run the program again and if it tries to execute your line, the computer will stop with a syntax error. Delete the illegal character to return your program to normal. If you don't get the error, of course, it's proof that the line in question was not executed.

Kapil Raina
Neshanic Station, New Jersey

Better IF statements: Shorter statements are easier to type and quicker for the computer to process. There are two important ways to shorten most IF statements. Say you have a statement like this:

```
100 IF J<>0 THEN GOTO 150
```

The GOTO is redundant and unnecessary. You can always eliminate it after a THEN statement. So it's better to type the above line as

```
100 IF J<>0 THEN 150
```

When an IF statement is followed by a variable rather than a relational expression, it defaults to binary or Boolean logic. A relational expression is one using the equals, greater than or less than symbols, or any combination thereof. In our example, the relational expression is J<>0. When binary or Boolean logic is operative, the IF statement will be false only when the variable has a value of zero. It will be true for all other values of the variable.

In our example expression, we only go to line 150 if J is nonzero. Therefore we can shorten it even further to

```
100 IF J THEN 150
```

James M. Whiteside
Warren, Ohio

Setting SPRDEF background colors: If you've created sprites on the 128, you know how the SPRDEF command works and how to alter the sprite color by using CONTROL or Commodore and the number keys.

If you want to design your sprite against its planned background color, use the COLOR command before entering SPRDEF. Change the screen color by using COLOR in direct mode, without a line number. For example, COLOR,0,1 will give you a black background. Now enter SPRDEF and enjoy designing your sprite.
Stephen Knapick
New Rochelle, New York

CHAR trickery: To gain access to upper- and lower-case characters when using the 128's CHAR statement on a bit-mapped screen, just POKE4588,216. The normal content of this location is 208, which gives you access to upper-case characters and the keyboard graphics set.

By the way, the CHAR statement works on normal text screens as well as on graphics screens and can be used to place text wherever you'd like. It's often easier to use CHAR than to use the usual combination of prints, tabs and cursor control characters.
Dick Johnson
Norco, California

Another escape sequence: There's an undocumented function in the 128's screen editor. It is ESC ESC (pressing the escape key twice in succession). This sequence disables reverse characters, quote mode and the insert mode caused by leftover INST keypresses.
Charles Lavin
Coral Gables, Florida

Which BANK? The 128's BANK command is useful for switching memory configurations. Unfortunately, there's no related function to determine the bank with which BASIC is working. You can find the current bank, though, by peeking location 981. The number returned is the number that was given in the most recent BANK command.
Charles Lavin
Coral Gables, Florida

Ultimate function key disabler: The easiest way to disable the 128's function keys is with POKE 828,183. This redefines the vector to the routine that interprets the function keys. After doing the poke, all keys revert to their standard character codes, but the function key definitions are not touched. To restore these definitions, use POKE 828,173.

By the way, the standard character codes for the F-keys are

F1=133	F3=134	F5=135	F7=136
F2=137	F4=138	F6=139	F8=140
RUN=131	HELP=132		

These numbers are returned by the ASC function for keystrokes captured by GET or GETKEY.
Charles Lavin
Coral Gables, Florida

DOS SHELL speedup: To speed the loading of the DOS SHELL on the 128, insert the disk after you get the READY prompt, then type BOOT and press RETURN. The program will load in about ten seconds as opposed to 25 seconds when it loads by resetting with the disk in the drive.
Jeff McKee
Rochester, New York

128 magazine entry tip: As printed in the back of the magazine, this program takes about 30 seconds to poke its machine language into memory. By adding these two lines, that time is cut in half:

```
7 FAST
115 SLOW
```

Since the screen is blanked out when the 128 is in FAST mode, lines 10 and 80 can be deleted.
James Hallman
Owensboro, Kentucky

Alcohol tip: Be careful when buying alcohol to use in cleaning your computer, especially if you intend to use it in your disk head cleaning kit. There's a big difference between isopropyl alcohol and isopropyl rubbing alcohol. The latter usually contains a trace of glycerine to make it less drying to the skin. Unfortunately, the glycerine remains after the alcohol evaporates, and it could be detrimental to your disk drive head or other sensitive parts.

I'm a retired hospital employee, and we could not use the rubbing alcohol to clean surgical instruments because of the film. It gave bacteria a place to grow.
ClarenceW1
Q-Link

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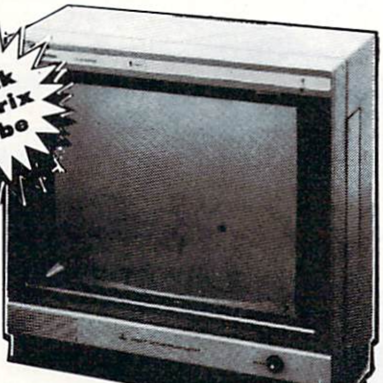
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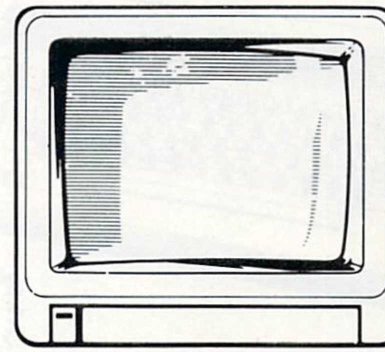
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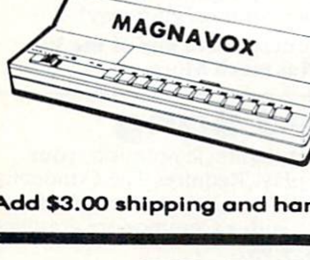
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The programs which appear in this magazine have been run, tested and checked for bugs and errors. After a program is tested, it is printed on a letter quality printer with some formatting changes. This listing is then photographed directly and printed in the magazine. Using this method ensures the most error-free program listings possible.

Whenever you see a word inside brackets, such as [DOWN], the word represents a keystroke or series of keystrokes on the keyboard. The word [DOWN] would be entered by pressing the cursor-down key. If multiple keystrokes are required, the number will directly follow the word. For example, [DOWN4] would mean to press the cursor-down key four times. If there are multiple words within one set of brackets, enter the keystrokes directly after one another. For example, [DOWN-,RIGHT2] would mean to press the cursor-down key once and then the cursor-right key twice. Note: Do not enter the commas.

In addition to these graphic symbols, the keyboard graphics are all represented by a word and a letter. The word is either SHFT or CMD and represents the SHIFT key or the Commodore key. The letter is one of the letters on the keyboard. The combination [SHFT E] would be entered by holding down the SHIFT key and pressing the E. A number following the letter tells you how many times to type the letter. For example, [SHFT A4,CMD B3] would mean to hold the SHIFT key and press the A four times, then hold down the Commodore key and press the B three times.

The following chart tells you the keys to press for any word or words inside of brackets. Refer to this chart whenever you aren't sure what keys to press. The little graphic next to the keystrokes shows you what you will see on the screen.

SYNTAX ERROR

This is by far the most common error encountered while entering a program. Usually (sorry folks) this means that you have typed something incorrectly on the line the syntax error refers to. If you get the message "?Syntax Error Break In Line 270", type LIST 270 and press RETURN. This will list line 270 to the screen. Look for any non-obvious mistakes like a zero in place of an O or vice-versa. Check for semicolons and colons reversed and extra or missing parenthesis. All of these things will cause a syntax error.

There is only one time a syntax error will tell you the 'wrong' line to look at. If the line the syntax error refers to has a function call (i.e., FN A(3)), the syntax error may be in the line that defines the function, rather than the line named in the error message. Look for a line near the beginning of the program (usually) that has DEF FN A(X) in it with an equation following it. Look for a typo in the equation part of this definition.

ILLEGAL QUANTITY ERROR

This is another common error message. This can also be caused by a typing error, but it is a little harder to find. Once again, list the line number that the error message refers to. There is probably a poke statement on this line. If there is, then the error is referring to what is trying to be poked. A number must be in the range of zero to 255 to be poke-able. For example, the statement POKE 1024,260 would produce an illegal quantity error because 260 is greater than 255.

Most often, the value being poked is a variable (A,X...). This error is telling you that this variable is out of range. If the variable is being read from data statements, then the problem is somewhere in the data statements. Check the data statements for missing commas or other typos.

If the variable is not coming from data statements, then the problem will be a little harder to find. Check each line that contains the variable for typing mistakes.

OUT OF DATA ERROR

This error message is always related to the data statements in a program. If this error occurs, it means that the program has run out of data items before it was supposed to. It is usually caused by a problem or typo in the data statements. Check first to see if you have left out a whole line of data. Next, check for missing commas between numbers. Reading data from a page of a magazine can be a strain on the brain, so use a ruler or a piece of paper or anything else to help you keep track of where you are as you enter the data.

OTHER PROBLEMS

It is important to remember that the 64 and the PET/CBM computers will only accept a line up to 80 characters long. The VIC 20 will accept a line up to 88 characters long. Sometimes you will find a line in a program that runs over this number of characters. This is not a mistake in the listing. Sometimes programmers get so carried away crunching programs that they use abbreviated commands to get more than 80 (or 88) characters on one line. You can enter these lines by abbreviating the commands when you enter the line. The abbreviations for BASIC commands are on pages 133-134 of the VIC 20 user guide and 130-131 of the Commodore 64 user's guide.

If you type a line that is longer than 80 (or 88) characters, the computer will act as if everything is ok, until you press RETURN. Then, a syntax error will be displayed (without a line number). Many people write that the computer gives them a syntax error when they type the line, or that the computer refuses to accept a line. Both of these problems are results of typing a line of more than 80 (or 88) characters.

"[HOME]" = UNSHIFTED CLR/ HOME
"[CLEAR]" = SHIFTED CLR/HOME
"[DOWN]" = CURSOR DOWN
"[UP]" = CURSOR UP
"[RIGHT]" = CURSOR RIGHT
"[LEFT]" = CURSOR LEFT
"[RVS]" = CONTROL 9
"[RVOFF]" = CONTROL 0
"[BLACK]" = CONTROL 1
"[WHITE]" = CONTROL 2
"[RED]" = CONTROL 3
"[CYAN]" = CONTROL 4
"[PURPLE]" = CONTROL 5
"[GREEN]" = CONTROL 6
"[BLUE]" = CONTROL 7
"[YELLOW]" = CONTROL 8
"[ORANGE]" = COMMODORE 1
"[BROWN]" = COMMODORE 2
"[L. RED]" = COMMODORE 3
"[GRAY1]" = COMMODORE 4
"[GRAY2]" = COMMODORE 5
"[L. GREEN]" = COMMODORE 6
"[L. BLUE]" = COMMODORE 7
"[GRAY3]" = COMMODORE 8
"[F1]" = F1
"[F2]" = F2
"[F3]" = F3
"[F4]" = F4
"[F5]" = F5
"[F6]" = F6
"[F7]" = F7
"[F8]" = F8
"[POUND]" = ENGLISH POUND
"[SHFT ^]" = PI SYMBOL
"[^]" = UP ARROW

GRAPHIC SYMBOLS WILL BE REPRESENTED AS EITHER THE LETTERS SHFT (SHIFT) AND A KEY ("[SHFT Q,SHFT J,SHFT D,SHFT S]") OR THE LETTERS CMDR (COMMODORE) AND A KEY ("[CMDR Q,CMDR G,COMDR Y,CMDR H]"). IF A SYMBOL IS REPEATED, THE NUMBER OF REPITITIONS WILL BE DIRECTLY AFTER THE KEY AND BEFORE THE COMMA ("[SPACE3,SHFT S4,CMDR M2]").

THE PROGRAM WON'T RUN!!

This is the hardest of problems to resolve; no error message is displayed, but the program just doesn't run. This can be caused by many small mistakes typing a program in. First check that the program was written for the computer you are using. Check to see if you have left out any lines of the program. Check each line of the program for typos or missing parts. Finally, press the RUN/STOP key while the program is 'running'. Write down the line the program broke at and try to follow the program backwards from this point, looking for problems.

IF ALL ELSE FAILS

You've come to the end of your rope. You can't get the program to run and you can't find any errors in your typing. What do you do? As always, we suggest that you try a local user group for help. In a group of even just a dozen members, someone is bound to have typed in the same program. The user group may also have the program on a library disk and be willing to make a copy for you.

If you do get a working copy, be sure to compare it to your own version so that you can learn from your errors and increase you understanding of programming.

If you live in the country, don't have a local user group, or you simply can't get any help, write to us. If you do write to us, include the following information about the program you are having problems with:

The name of the program
The issue of the magazine it was in
The computer you are using
Any error messages and the line numbers
Anything displayed on the screen
A printout of your listing (if possible)

All of this information is helpful in answering your questions about why a program doesn't work. A letter that simply states "I get an error in line 250 whenever I run the program" doesn't give us much to go on. Send your questions to:

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ATTN: Program Problem

Have fun with the programs!

HOW TO USE THE MAGAZINE ENTRY PROGRAMS

The Magazine Entry Programs on the next pages are two BASIC machine language programs that will assist you in entering the programs in this magazine correctly. There are versions for both the Commodore 64 and the Commodore 128. Once the program is in place, it works its magic without you having to do anything else. The program will not let you enter a line if there is a typing mistake on it, and better yet, it identifies the kind of error for you.

Getting Started

Type in the Magazine Entry Program carefully and save it as you go along (just in case). Once the whole program is typed in, save it again on tape or disk. Now RUN the program. The word POKING will appear on the top of the screen with a number. The number will increment from 49152 up to 49900 (4864-5545 on the 128) and just lets you know that the program is running. If everything is ok, the program will finish running and say DONE. Then type NEW. If there is a problem with the data statements, the program will tell you where to find the problem. Otherwise the program will say "mistake in data statements." Check to see if commas are missing, or if you have used periods instead of commas. Also check the individual data items.

Once the program has run, it is in memory ready to go. To activate the program type SYS49152 (SYS4864 on the 128), and press RETURN. You are now ready to enter the programs from the magazine. To disable the Entry Program, just type KILL (RETURN) on the 64 or SYS4867 on the 128.

The checksums for each line are the same for both the 64 and 128, so you can enter your 64 programs on the 128 if you'd like.

Typing the Programs

All the BASIC program listings in this magazine that are for the 64 or 128 have an apostrophe followed by four letters at the end of the line (e.g., 'ACDF). If you plan to use the Magazine Entry Program to enter your programs, the apostrophe and letters **should** be entered along with the rest of the line. This is a checksum that the Magazine Entry Program uses.

Enter the line and the letters at the end and then press RETURN, just as you normally would.

If the line is entered correctly, a bell is sounded and the line is entered into the computer's memory (without the characters at the end).

If a mistake was made while entering the line, a noise is sounded and an error message is displayed. Read the error message, then press any key to erase the message and correct the line.

IMPORTANT

If the Magazine Entry Program sees a mistake on a line, it **does not** enter that line into memory. This makes it impossible to enter a line incorrectly.

Error Messages and What They Mean

There are five error messages that the Magazine Entry Program uses. Here they are, along with what they mean and how to fix them.

NO CHECKSUM: This means that you forgot to enter the apostrophe and the four letters at the end of the line. Move the cursor to the end of the line you just typed and enter the checksum.

QUOTE: This means that you forgot (or added) a quote mark somewhere in the line. Check the line in the magazine and correct the quote.

KEYWORD: This means that you have either forgotten a command or spelled one of the BASIC keywords (GOTO, PRINT..) incorrectly. Check the line in the magazine again and check your spelling.

OF CHARACTERS: This means that you have either entered extra characters or missed some characters. Check the line in the magazine again. This error message will also occur if you misspell a BASIC command, but create another keyword in doing so. For example, if you misspell PRINT as PRONT, the 64 sees the letter P and R, the BASIC keyword ON and then the letter T. Because it sees the keyword ON, it thinks you've got too many characters, instead of a simple misspelling. Check spelling of BASIC commands if you can't find anything else wrong.

UNIDENTIFIED: This means that you have either made a simple spelling error, you typed the wrong line number, or you typed the checksum incorrectly. Spelling errors could be the wrong number of spaces inside quotes, a variable spelled wrong, or a word misspelled. Check the line in the magazine again and correct the mistake.

```
10 PRINT"[CLEAR]POKING -";
20 P=49152 :REM $C000  (END AT
   49900/$C2EC)
30 READ A$:IF A$="END"THEN 110
40 L=ASC(MID$(A$,2,1))
50 H=ASC(MID$(A$,1,1))
60 L=L-48:IF L>9 THEN L=L-7
70 H=H-48:IF H>9 THEN H=H-7
80 PRINT"[HOME,RIGHT12]"P;
90 IF H>15 OR L>15 THEN PRINT
   :PRINT"DATA ERROR IN LINE";
   1000+INT((P-49152)/8):STOP
100 B=H*16+L:POKE P,B:T=T+B:P=P+1
    :GOTO 30
110 IF T<>86200 THEN PRINT
    :PRINT"MISTAKE IN DATA --> CHECK
    DATA STATEMENTS":END
120 PRINT"DONE":END
1000 DATA 4C,1F,C0,00,00,00,00,00
1001 DATA 00,00,00,00,00,0D,00,21
1002 DATA C1,27,C1,2F,C1,3F,C1,4C
1003 DATA C1,EA,EA,EA,4C,54,C0,A2
1004 DATA 05,BD,19,C0,95,73,CA,10
1005 DATA F8,60,60,A0,03,B9,00,02
1006 DATA D9,04,C1,D0,F5,88,10,F5
1007 DATA A0,05,B9,A2,E3,99,73,00
1008 DATA 88,10,F7,A9,00,8D,18,D4
1009 DATA 4C,EF,C0,E6,7A,D0,02,E6
1010 DATA 7B,4C,79,00,A5,9D,F0,F3
1011 DATA A5,7A,C9,FF,D0,ED,A5,7B
1012 DATA C9,01,D0,E7,20,2B,C0,AD
1013 DATA 00,02,20,74,C0,90,DC,A0
1014 DATA 00,4C,A9,C1,C9,30,30,06
1015 DATA C9,3A,10,02,38,60,18,60
1016 DATA C8,B1,7A,C9,20,D0,03,C8
1017 DATA D0,F7,B1,7A,60,18,C8,B1
1018 DATA 7A,F0,37,C9,22,F0,F5,6D
1019 DATA 03,C0,8D,03,C0,AD,04,C0
1020 DATA 69,00,8D,04,C0,4C,8E,C0
1021 DATA 18,6D,05,C0,8D,05,C0,90
1022 DATA 03,EE,06,C0,EE,09,C0,4C
1023 DATA CE,C1,18,6D,08,C0,8D,08
1024 DATA C0,90,03,EE,07,C0,EE,0A
1025 DATA C0,60,0A,A8,B9,0F,C0,85
1026 DATA FB,B9,10,C0,85,FC,A0,00
1027 DATA A9,12,20,D2,FF,B1,FB,F0
1028 DATA 06,20,D2,FF,C8,D0,F6,20
1029 DATA BC,C2,20,E4,FF,F0,FB,A0
1030 DATA 18,B9,08,C1,20,D2,FF,88
1031 DATA 10,F7,68,68,A9,00,8D,00
1032 DATA 02,4C,74,A4,4B,49,4C,4C
1033 DATA 91,91,0D,20,20,20,20,20
1034 DATA 20,20,20,20,20,20,20,20
1035 DATA 20,20,20,20,20,20,20,91
1036 DATA 0D,51,55,4F,54,45,00,4B
1037 DATA 45,59,57,4F,52,44,00,23
1038 DATA 20,4F,46,20,43,48,41,52
1039 DATA 41,43,54,45,52,53,00,55
1040 DATA 4E,49,44,45,4E,54,49,46
1041 DATA 49,45,44,00,4E,4F,20,43
1042 DATA 48,45,43,4B,53,55,4D,00
1043 DATA C8,B1,7A,D0,FB,84,FD,C0
1044 DATA 09,10,03,4C,84,C1,88,88
1045 DATA 88,88,88,B1,7A,C9,27,D0
1046 DATA 13,A9,00,91,7A,C8,A2,00
1047 DATA B1,7A,9D,3C,03,C8,E8,E0
1048 DATA 04,D0,F5,60,A9,04,4C,CA
1049 DATA C0,A0,00,B9,00,02,99,40
1050 DATA 03,F0,F0,C8,D0,F5,A0,00
1051 DATA B9,40,03,F0,E6,99,00,02
1052 DATA C8,D0,F5,20,96,C1,4C,12
1053 DATA C2,A0,09,A9,00,99,03,C0
1054 DATA 8D,3C,03,88,10,F7,A9,80
1055 DATA 85,02,A0,00,20,58,C1,20
1056 DATA 89,C1,20,ED,C1,E6,7A,E6
1057 DATA 7B,20,7C,A5,A0,00,20,80
1058 DATA C0,F0,D0,24,02,F0,06,4C
1059 DATA A8,C0,4C,CE,C1,C9,22,D0
1060 DATA 06,20,8D,C0,4C,CE,C1,20
1061 DATA BA,C0,4C,CE,C1,A0,00,B9
1062 DATA 00,02,20,74,C0,C8,90,0A
1063 DATA 18,6D,07,C0,8D,07,C0,4C
1064 DATA EF,C1,88,A2,00,B9,00,02
1065 DATA 9D,00,02,F0,04,E8,C8,D0
1066 DATA F4,60,18,AD,09,C0,69,41
1067 DATA 8D,09,C0,38,AD,0A,C0,E9
1068 DATA 19,90,06,8D,0A,C0,4C,1C
1069 DATA C2,AD,0A,C0,69,41,8D,0A
1070 DATA C0,AD,03,C0,6D,05,C0,48
1071 DATA AD,04,C0,6D,06,C0,8D,0C
1072 DATA C0,68,6D,08,C0,8D,0B,C0
1073 DATA AD,0C,C0,6D,07,C0,8D,0C
1074 DATA C0,38,E9,19,90,06,8D,0C
1075 DATA C0,4C,52,C2,AD,0C,C0,69
1076 DATA 41,8D,0C,C0,AD,0B,C0,E9
1077 DATA 19,90,06,8D,0B,C0,4C,67
1078 DATA C2,AD,0B,C0,69,41,8D,0B
1079 DATA C0,A0,01,AD,09,C0,CD,3C
1080 DATA 03,D0,20,C8,AD,0A,C0,CD
1081 DATA 3D,03,D0,17,C8,AD,0B,C0
1082 DATA CD,3E,03,D0,0E,AD,0C,C0
1083 DATA CD,3F,03,D0,06,20,CC,C2
1084 DATA 4C,4B,C0,98,48,68,4C,CA
1085 DATA C0,A9,20,8D,00,D4,8D,01
1086 DATA D4,A9,09,8D,05,D4,A9,0F
1087 DATA 8D,18,D4,60,20,A9,C2,A9
1088 DATA 81,20,DF,C2,A9,80,20,DF
1089 DATA C2,4C,D9,C2,20,A9,C2,A9
1090 DATA 11,20,DF,C2,A9,10,20,DF
1091 DATA C2,A9,00,8D,04,D4,60,8D
1092 DATA 04,D4,A2,70,A0,00,88,D0
1093 DATA FD,CA,D0,FA,60,END
```

END

Magazine Entry Program—128

```
5 TRAP 200
10 PRINT"[CLEAR]POKING -";
20 P=4864 :REM $1300  (END AT
   5545/$15A9)
30 READ A$:IF A$="END"THEN 110
80 PRINT"[HOME,RIGHT12]"P;
100 B=DEC(A$):POKE P,B:T=T+B:P=P+1
   :GOTO 30
110 IF T<>59311 THEN PRINT
   :PRINT"MISTAKE IN DATA --> CHECK
   DATA STATEMENTS":END
120 PRINT"DONE":END
200 PRINT:PRINT"DATA ERROR IN LINE";
   1000+INT((P-4864)/8):END
1000 DATA 4C,1E,13,4C,3A,13,00,00
1001 DATA 8E,00,F7,00,42,41,51,57
1002 DATA 0D,00,0D,43,08,14,0E,14
1003 DATA 16,14,26,14,33,14,A9,00
1004 DATA 8D,00,FF,AD,04,03,8D,12
1005 DATA 13,AD,05,03,8D,13,13,A2
1006 DATA 4A,A0,13,8E,04,03,8C,05
1007 DATA 03,60,AD,12,13,8D,04,03
1008 DATA AD,13,13,8D,05,03,60,6C
1009 DATA 12,13,A5,7F,D0,F9,AD,00
1010 DATA 02,20,5B,13,90,F1,A0,00
1011 DATA 4C,6F,14,C9,30,30,06,C9
1012 DATA 3A,10,02,38,60,18,60,C8
1013 DATA B1,3D,C9,20,D0,03,C8,D0
1014 DATA F7,B1,3D,60,18,C8,B1,3D
1015 DATA F0,35,C9,22,F0,F5,6D,06
1016 DATA 13,8D,06,13,AD,07,13,69
1017 DATA 00,8D,07,13,4C,75,13,18
1018 DATA 6D,08,13,8D,08,13,90,03
1019 DATA EE,09,13,EE,0C,13,60,18
1020 DATA 6D,0B,13,8D,0B,13,90,03
1021 DATA EE,0A,13,EE,0D,13,60,0A
1022 DATA A8,B9,14,13,85,FB,B9,15
1023 DATA 13,85,FC,A0,00,8C,00,FF
1024 DATA A9,12,20,D2,FF,B1,FB,F0
1025 DATA 06,20,D2,FF,C8,D0,F6,20
1026 DATA 79,15,20,A3,15,20,E4,FF
1027 DATA F0,FB,A0,1B,B9,EF,13,20
1028 DATA D2,FF,88,10,F7,68,68,A9
1029 DATA 00,8D,00,02,4C,B7,4D,91
1030 DATA 91,0D,20,20,20,20,20,20
1031 DATA 20,20,20,20,20,20,20,20
1032 DATA 20,20,20,20,20,20,91,0D
1033 DATA 51,55,4F,54,45,00,4B,45
1034 DATA 59,57,4F,52,44,00,23,20
1035 DATA 4F,46,20,43,48,41,52,41
1036 DATA 43,54,45,52,53,00,55,4E
1037 DATA 49,44,45,4E,54,49,46,49
1038 DATA 45,44,00,4E,4F,20,43,48
1039 DATA 45,43,4B,53,55,4D,00,C8
1040 DATA B1,3D,D0,FB,C0,06,10,03
1041 DATA 4C,69,14,88,88,88,88,88
1042 DATA B1,3D,C9,27,D0,13,A9,00
1043 DATA 91,3D,C8,A2,00,B1,3D,9D
1044 DATA 00,0B,C8,E8,E0,04,D0,F5
1045 DATA 60,4C,5C,15,4C,C5,14,A0
1046 DATA 09,A9,00,99,06,13,8D,00
1047 DATA 0B,88,10,F7,A9,80,85,FD
1048 DATA A0,00,20,3F,14,20,AE,14
1049 DATA 20,0D,43,84,FA,A0,FF,20
1050 DATA 67,13,F0,D8,24,FD,F0,06
1051 DATA 20,8F,13,4C,8F,14,C9,22
1052 DATA D0,06,20,74,13,4C,8F,14
1053 DATA 20,9F,13,4C,8F,14,A0,00
1054 DATA B9,00,02,20,5B,13,C8,90
1055 DATA 0A,18,6D,0A,13,8D,0A,13
1056 DATA 4C,B0,14,88,60,18,AD,0C
1057 DATA 13,69,41,8D,0C,13,38,AD
1058 DATA 0D,13,E9,19,90,06,8D,0D
1059 DATA 13,4C,CF,14,AD,0D,13,69
1060 DATA 41,8D,0D,13,AD,06,13,6D
1061 DATA 08,13,48,AD,07,13,6D,09
1062 DATA 13,8D,0F,13,68,6D,0B,13
1063 DATA 8D,0E,13,AD,0F,13,6D,0A
1064 DATA 13,8D,0F,13,38,E9,19,90
1065 DATA 06,8D,0F,13,4C,05,15,AD
1066 DATA 0F,13,69,41,8D,0F,13,AD
1067 DATA 0E,13,E9,19,90,06,8D,0E
1068 DATA 13,4C,1A,15,AD,0E,13,69
1069 DATA 41,8D,0E,13,A0,01,AD,0C
1070 DATA 13,CD,00,0B,D0,20,C8,AD
1071 DATA 0D,13,CD,01,0B,D0,17,C8
1072 DATA AD,0E,13,CD,02,0B,D0,0E
1073 DATA AD,0F,13,CD,03,0B,D0,06
1074 DATA 20,89,15,A4,FA,60,98,48
1075 DATA 68,4C,AF,13,A9,04,4C,AF
1076 DATA 13,A9,00,8D,00,FF,A9,20
1077 DATA 8D,00,D4,8D,01,D4,A9,09
1078 DATA 8D,05,D4,A9,0F,8D,18,D4
1079 DATA 60,20,61,15,A9,81,20,9C
1080 DATA 15,A9,80,20,9C,15,4C,96
1081 DATA 15,20,61,15,A9,11,20,9C
1082 DATA 15,A9,10,20,9C,15,A9,00
1083 DATA 8D,04,D4,60,8D,04,D4,A2
1084 DATA 70,A0,00,88,D0,FD,CA,D0
1085 DATA FA,60,END
```

END

Continued from pg. 100

```
990 SYS 3100:SYS 3200'CJEO
1000 :'ABHS
1010 PRINT"[CLEAR,DOWN,RIGHT]
     YOU CAN PUT JUST":PRINT"[DOWN,
     RIGHT2]ABOUT ANYTHING"'CBDE
1020 PRINT"[DOWN,RIGHT]
     HERE YOU WANT TO":GOSUB 5000'CFOB
1030 GET KEY Z$'CCYX
1050 IF Z$="N"THEN SYS 3200
     :GOTO 1100'FLCD
1060 IF Z$="L"THEN SYS 3300
     :PRINT"[HOME]":GOTO 265'GLNF
1070 IF Z$<>"E"THEN 1030'EGEE
1080 GOTO 2000'BEYC
1090 :'ABHC
1100 PRINT"[CLEAR,RIGHT]
     ANOTHER EXAMPLE":PRINT"[DOWN,
     RIGHT2]OF USER INPUT."'CBTE
1120 PRINT"[DOWN,RIGHT2]
     ENTER FILENAME"'BAHA
1130 POKE 208,1:POKE 842,34
     :INPUT FL$'DQFC
1135 GOSUB 5000'BEGD
1140 GET KEY Z$'CCYA
1150 IF Z$="N"THEN SYS 3200
     :GOTO 1200'FLDE
1160 IF Z$="L"THEN SYS 3300:
     :GOTO 1030'FMLF
1170 IF Z$<>"E"THEN 1140'EGGF
1180 GOTO 2000'BEYD
1200 PRINT"[CLEAR,SPACE3]SAMPLE
     [SPACE2]MENU"'BAFY
1210 PRINT"[DOWN] LOAD[SPACE6]
     SAVE"'BAYY
1220 PRINT" RENAME[SPACE4]VERIFY"'BAJB
1230 PRINT" SCRATCH[SPACE3]NEW"'BAVC
1240 PRINT" COPY[SPACE6]INIT."'BAFD
1250 GOSUB 5000'BEGB
1260 GET KEY Z$'CCYD
1270 IF Z$="L"THEN SYS 3300
     :GOTO 1140'FLFH
1280 IF Z$="N"THEN SYS 3200
     :GOTO 1300'FLEI
1290 GOTO 2000'BEYF
1300 PRINT"[CLEAR,DOWN]
      SEE HOW EASY IT":PRINT"[SPACE2]
     IS TO USE THIS":PRINT"PROGRAM,
     "NM$"?"'DFGK
1320 PRINT"[DOWN]THAT'S THE TICKET!"
     :PRINT"[DOWN] [RVS]L[RVOFF]
     AST OR [RVS]E[RVOFF]ND DEMO"'CBUJ
1330 GET KEY Z$'CCYB
1340 IF Z$="L"THEN SYS 3300
     :GOTO 1260'FLIF
1350 IF Z$<>"E"THEN 1330'EGHF
2000 FOR X=12 TO 0 STEP-1
     :WINDOW X,X,39-X,24-X,1
     :FOR C=1 TO 60:NEXT:NEXT'NCAI
2010 COLOR 0,12:COLOR 4,14:COLOR 5,14
     :END'EPTB
5000 PRINT"[DOWN,RIGHT2,RVS]N[RVOFF]
     EXT [RVS]L[RVOFF]AST [RVS]E
     [RVOFF]ND?":RETURN'CBLE
```

END

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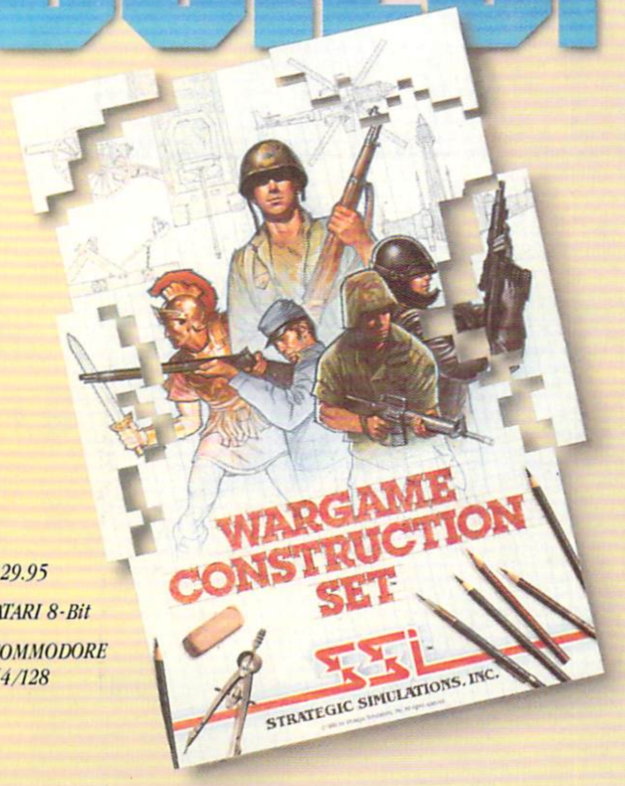
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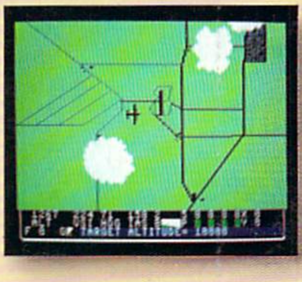
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